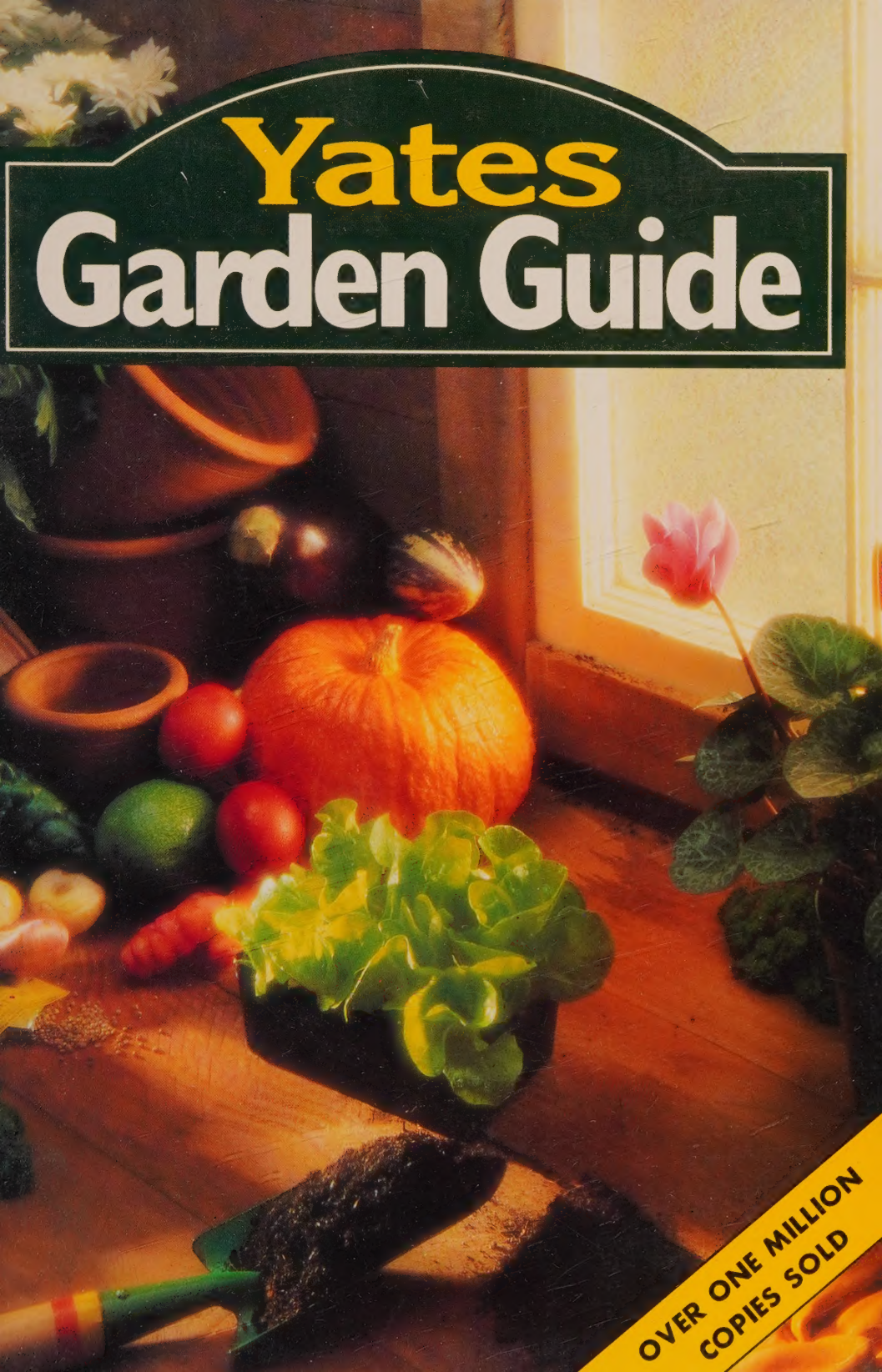
Yates Garden Guide



OVER ONE MILLION COPIES SOLD


Digitized by the Internet Archive
in 2025

https://archive.org/details/isbn_9400099560293

Yates

GARDEN GUIDE



INTRODUCTION





The Yates Garden Guide was first published in 1895 as a down to earth gardening manual for New Zealand conditions. Over the years it has become one of this country's all time best sellers and its presence, in its various editions, is a familiar sight in New Zealand homes.

This edition, brings together the most up to date information and developments in horticulture as related to the home gardener. It includes the old time favourite varieties of vegetables, flowers, fruits and ornamentals as well as the new modern varieties with their improved yields, quality and pest resistance.

The Yates Garden Guide is a practical handbook of gardening providing guidance for the beginner, inspiration for the reluctant and is an indispensable first reference for the enthusiast.

Regardless of garden size, this book is full of sensible, practical easy to follow advice making gardening a fun, rewarding activity enhancing our lives and homes.

ISBN 0-9597 843-0-6

© **Copyright Yates New Zealand Limited**
All rights reserved. No part of this book may be reproduced in any form or by any means without the prior written permission of the publisher.

First published 1895
61st edition (completely revised and rewritten) published September 1987
66th edition published October 1990
bringing the total number of printed copies to over 1,030,000.

Published by **Yates New Zealand Limited**
Compiled by **Margaret McKee**
Design by **Sally Hollis-McLeod**

CONTENTS



Garden Design	1
Soils and Water	8
Fertiliser	17
Garden Tools	27
Seed	36
Vegetative Propagation	49
Vegetables	54
Flowers from Seed	100
Herbs	147
Perennials and Climbers	153
Bulbs	162
Roses	186
Trees, Shrubs and Hedges	194
New Zealand Native Plants	214
Lawns and Ground Covers	225
Fruits and Nuts	236
Container Gardening	261
Organic Gardening	273
Pests and Diseases	276
Garden Weeds	300
Your Gardening Calendar	308
Yates History	336
Index	





CHAPTER ONE

GARDEN DESIGN

THE GARDEN is a place to be lived in and enjoyed. It should be easy to maintain yet full of colour and variety throughout the year and also functional, catering for family needs and activities. Despite the increasing demands on our leisure time today, interest in gardening continues to grow. It is important that a garden is well designed so that it can safely mature in the way it was planned without needing constant attention.

CONSIDER YOUR NEEDS

THE FIRST stage in planning a garden is to consider how you will use it. The demands of a family can vary a great deal over a number of years. A young couple may need the garden mainly for lying in the sun or entertaining and would want a layout which needed little attention.

The arrival of children creates a need for play areas and tricycle runs. With a growing family, a bigger area of the garden is devoted to outdoor activities and perhaps a vegetable garden or home orchard.

As the children leave home, parents will have more time to spend in the garden. They are likely to concentrate more on the actual plants in the garden with possibly special interests developing such as roses, orchids or a greenhouse. What seems easy to look after when you are middle-aged can become too much of a handful when you are older.

Whatever the requirements of a garden, it should always serve as an extension of the house – an outside room or rooms where suitable activities can take place. The garden may also need to provide a place for car, caravan, boat and compost bin. In addition its frontage must enhance the house and be welcoming for guests. Making such a number of demands on a small area of land calls for careful planning.

STYLE

THOUGHT SHOULD be given to the style. The garden should complement the house, both practically and visually. For those living in an old villa, this is easy but for a modern suburban house, it is more difficult. The size of the section, style of the house, its height and position on the property all have considerable influence.

As a starting point, give some thought

SPECIAL FEATURES

With imagination and ingenuity one can introduce many special features to make the garden more interesting and attractive. There is certainly a lot of opportunity for creative thinking.

PATIOS

A patio is an uncovered area which is an extension of the house with access to the living room, dining room or kitchen. Ideally it faces north or east to catch the morning sun. It can be just a secluded corner under a tree, or it may include a barbecue, paved area with many containers, a pergola, perhaps a fountain or pool or even a swimming pool.

The paving surface of the patio should be smooth. There are many choices ranging from brick paving, concrete slabs and stone.

DECKS

A deck or timber platform offers another alternative for outdoor living. These are more commonly used on sloping sections which do not have a sufficiently large flat area for paving or where the living quarters are on the top storey of a two storeyed house. Low level decks can be used on flat sites as an alternative to paving.



to the building materials and to the interior style of the house. A rustic style of home calls for a sweep of lawn and planting in herbaceous borders, while a sophisticated modern one suits a more streamlined type of garden with a strong use of plants, concrete and cobblestones. Other types of houses – the townhouse, the seaside bach and the brick and tile home all have particular characteristics which call for a particular style of garden.

Today, the trend is towards flowing natural lines and blending of house and garden rather than a formal garden design with straight-edged, squared or rectangular beds and closely clipped hedges.

Every garden is unique and its character grows out of practical solutions to practical problems based on family needs.

EXISTING FEATURES

THE CONSTRAINTS of existing features such as local climate and soil are the first consideration in planning. Whatever type of soil you have, the topsoil is the most valuable. If building, it is a good idea to remove about 5cm of topsoil from the house site for use elsewhere. Any part of the garden which has been excavated to clay subsoil will need to be covered with a generous layer of imported topsoil. For more information, refer to the chapter on soils.

The weather is a major influence on the design and planting of the garden. There are also small variations within the garden which are known as microclimates. These are caused by shade, reflection of water or reflection of heat from a white wall or a slope facing towards the sun. Advantage can be taken of these microclimates in various ways to grow different types of plants.

Plants grow better and people enjoy outdoor living more if they are sheltered from strong winds. Wind breaks of trees,

WATER

Water can add movement, sparkle and tranquility to the garden. A swimming pool is sometimes used as a feature as well as for enjoyment. It should be sited in a warm and sheltered area. Ponds, streams, waterfalls and fountains are all interesting, and a footbridge over a created pond or stream adds rustic charm, especially to an entrance.



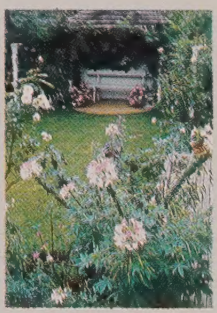
CONSERVATORY

The conservatory is a popular addition to the home and garden. It can be used for tender plants and as a place to relax in the sun on a cold winter's day.

PERGOLAS

A pergola is an extension of the house over a patio or terrace. A well designed pergola is an attractive addition to the house, joining the indoors and outdoors. It is also a structure to support vines and creepers, and hang pots or baskets.





shrubs, hedges or fences give good protection for distances up to ten times the height of the barrier. The best wind barriers are those which filter the wind, e.g. slatted fences or light foliage plants. Solid barriers create wind turbulence on both sides. With careful selection and placement of wind breaks, a better microclimate can be created.

It is important to consider the existing advantages of the garden. These may include mature trees and shrubs or a rocky outcrop. Do not get rid of them until you explore their full potential.

SPECIAL AREAS





Main Entrance

The main entrance to a property is most important. It should create a good first impression, enhance the house and be welcoming for guests. Access should be easy and comfortable. Allow plenty of width and area for turning and parking. The main pedestrian entrance should be obvious so that visitors are not perplexed and wander around the side of the house looking for an entrance. Ideally the major pedestrian entrance should be a footpath sufficiently wide for two people to walk side by side.

A Garden for Children

Swings, sandpits, tricycle tracks, a playhouse and lawn areas should be considered for the children's area. These could be adjacent to the entertainment area or part of it, and in a sheltered warm area, preferably enclosed and in view of a living room or kitchen window. The area should be safe and encourage challenging, creative play.

A Vegetable or Fruit Garden

In many garden plans, the vegetable or fruit garden finishes up in an unwanted space at the rear of the section. This may not always be ideal, and the requirements for fruit and vegetables should be considered. The area should have a sunny aspect, be sheltered from cold winds and have easy access from the house.

Certain shrubs which have been forced to grow in strange shapes may be worth preserving as a sculpture feature of the garden.

It can often be difficult to remove an old tree trunk below ground level. However, a stump can be made into an attractive feature of the garden as a base for climbing plants or a bench seat or table top.

Alternatively, you may not have a panoramic view, but perhaps a peep at a fine tree in a next-door garden to which you can orientate your view.

Glasshouses

Glasshouses are particularly popular in gardens in the colder areas of New Zealand where the growing season is short. Apart from producing out of season fruit and vegetables, it can also be used for the hobbyist who enjoys growing indoor or tender plants which require extra protection.



Bark

Bark chips are widely used in gardens and available in several different grades. In addition to providing an attractive cover, they act as a mulch, conserving soil moisture and deterring weeds. Bark gardens are a good choice for those after an attractive but minimum maintenance garden.

Rock Gardens

A rock garden offers many possibilities for creative planning on level sites and can add relief to the landscape. They are also useful in odd shaped corners, or for creating a natural rockery on sloping sites.



Theme Gardens

A theme such as a formal Japanese garden with pebbles, cherry trees, camellias, conifers and azaleas can be very attractive. An alpine garden created with scoria and alpine plants and mosses is always a talking point. A riverbed garden with the round stones and the appropriate planting has a relaxing atmosphere. A subtropical garden featuring big bold leaves of a brassaia or philodendron surrounded with hibiscus and gardenia complements a patio and swimming pool. An old English garden is a great feature for a villa or those with a love of flowers.

THE PLAN

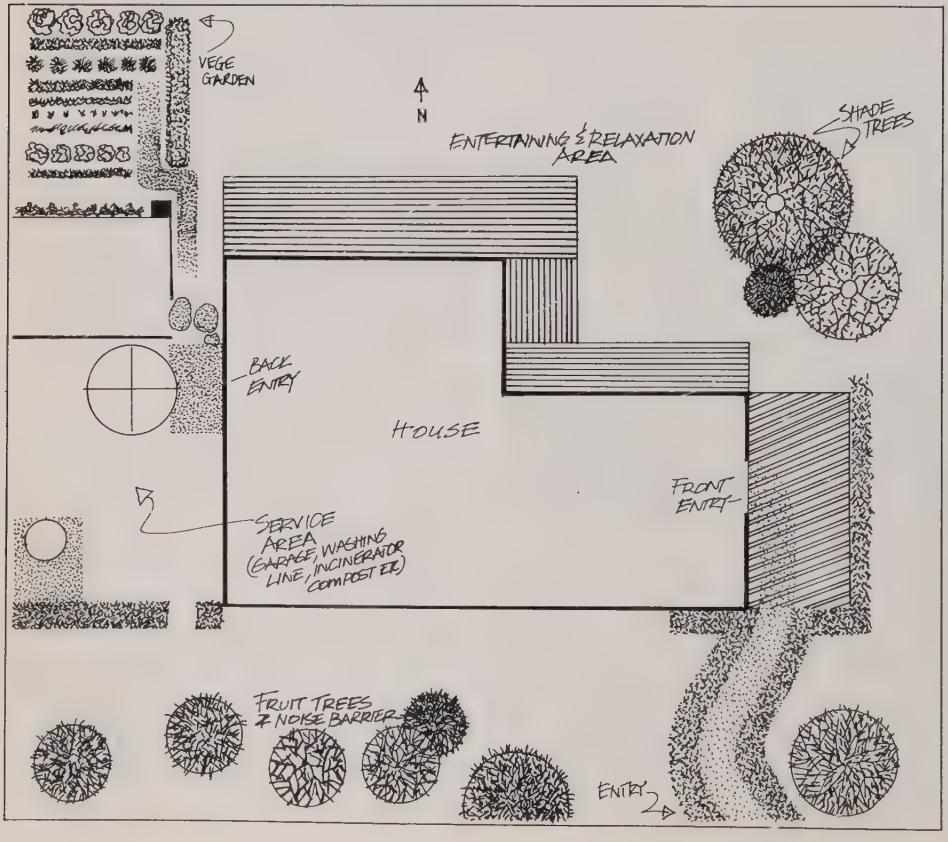
AFTER CONSIDERING the existing features – both good and bad – the next step is to make a scale plan. The site and the slope should be measured and drawn to scale on paper. Existing features e.g. house, garage, driveway and trees and rocks should be drawn in. Next, draw in a broad location of activity areas. Finally, decide on structures, features and major plants (supplementary plants such as small shrubs and ground covers can be added later).

CONSTRUCTION

ONCE PLANNING is done, it is important that development of the garden take place in the correct order so as to avoid disruption or the unnecessary removal of trees and shrubs at a later date. Contouring must first be done to establish level areas, slopes, terraces or excavations for construction. At the same time, drainage should also be considered. It is important, in heavy clay soils which do not drain, to ensure that the contour will run surface water away from the house or garden areas. On slopes, it may be necessary to install an intercepting drain above the house and garden. If underground tile drains are necessary, these should be installed at this stage.

If a major item such as a swimming pool is planned, it is considerably easier if it is done at this stage. However, if this is not possible but a pool is still wanted at a later date, provision for access should be considered.

The construction of decks and bridges, pergolas, streams or fences should be done next. This can be followed by the placing of rocks to create natural rocky outcrops or streambeds, as well as ponds or fountains.









Service areas, clothes lines, a glasshouse or garden shed can now be added. Steps should also be installed now. They create a great atmosphere especially if they are winding or have a slight curve. Always ensure that they have a tread which is at least two to three times wider than the height or lift.

Paving of drives, patios, entrance and other access routes can now be done.

Finally, the selection of trees and shrubs and their planting takes place. Always start with the large or specimen trees as these will have the major long-term effect in the garden.







CHAPTER TWO

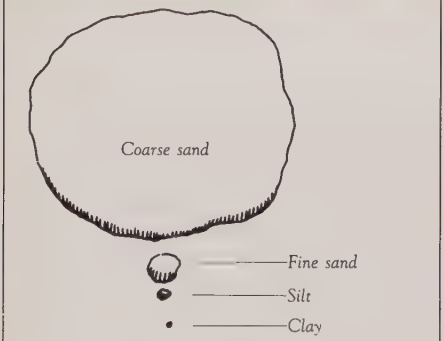
SOILS AND WATER

SOIL IS the medium in which most plants grow. It provides nutrients, water, air and anchorage for the plant. Soils vary considerably and as a result can have a tremendous effect on plant growth. Ideally plants must be able to take up from the soil all the nutrients and water required for plant growth, easily; anything that restricts this uptake will reduce plant growth. Physical restrictions are the most common, so it is important to have a basic understanding of the various components of soil and how they interact.

SOIL TEXTURE

SOIL IS made up of particles which vary in shape and size and thus determine the soil texture. Plant roots must have air to breathe and water to enable them to absorb nutrients. The particle size is important because it controls the amounts of air and water which reach the roots.

SOIL PARTICLES comparative size



SOIL STRUCTURE

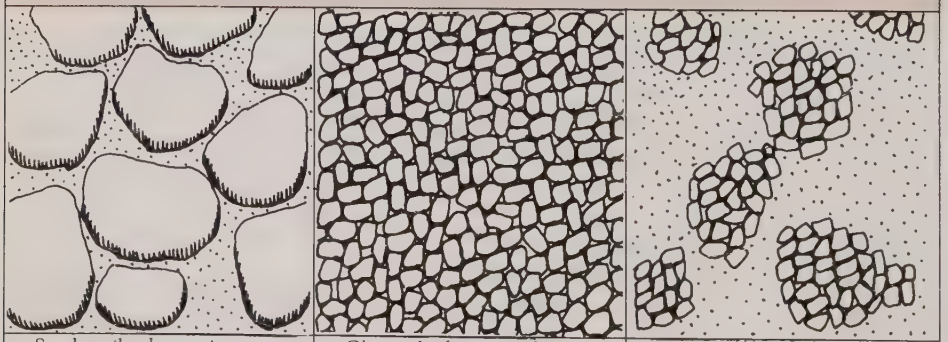
SOIL STRUCTURE is the way the particles combine together to form aggregates or groups. In a loam, small and large particles join together forming *crumbs*. A soil with a good tilth is one which has a good crumb structure. Organic matter will help create favourable conditions for aggregates. Gaps or pore spaces between these aggregates give the soil a water and air balance for best plant growth. To achieve gardening success, it is extremely important to make sure that the soil structure is correct.

CLAY SOILS

CLAY SOILS consist mainly of very fine particles which pack tightly together and result in very little air space and poor drainage. When wet the particles swell and stick together. Clay soils are cold, heavy and difficult to work. When it does dry out clay tends to set hard and crack, and there is danger of plant roots being damaged. Clay soils are the most difficult to manage and require the most attention to correct. The following advice should be helpful.

First, the drainage must be improved. As the subsoil and topsoil of a clay soil are tightly packed and will not drain, the easiest way to get an adequately drained area for plant growth is to build up a free draining area above the surrounding soil. This can be done by adding organic matter, e.g. peat or compost, to the surface, working it in and building up a bed, ridge or mound 20–30 cm above the surrounding soil. Deep digging of the subsoil sometimes helps, but with most clays this is a very temporary improvement. The addition of organic matter opens up the topsoil, allowing drainage and at the same time improving the moisture-holding capacity. In clay soils

STRUCTURE OF SOIL



Sandy soil- large airspaces allow free drainage but do not hold water or nutrients well	*Clay soil- fine particles are tightly packed together so drainage and aeration are poor*	*Improved clay soil- particles aggregated into clumps, improving airspace and drainage*

the soil moisture is held so tightly that plants have difficulty in taking up their requirements. The addition of organic matter adds a spongy texture to the clay making it easier for plant roots to penetrate and take up the moisture and nutrients.

The addition of coarse sand, scoria or pumice can also improve the aeration of clay soil. However, organic matter is more effective.

SANDY SOILS

SANDY SOILS have large particles with large air spaces between them. They are well aerated, are easy to cultivate and often called light soils. Because of the good aeration they warm up quickly in spring which makes them suitable for early vegetable crops. However, they do not hold water or nutrients well and frequent watering and application of fertiliser is necessary. The addition of bulky organic material such as compost and peat greatly improves sandy soils and helps overcome these problems. Sandy soil is common in most coastal areas.

SILT LOAM

THIS TYPE of soil can be variable according to its origin. Silt soils are usually built up from river flats or areas where overlays of various materials have been deposited, and are a mixture of many particle sizes and differing materials. Hence, they vary in drainage characteristics. Lowering of the water table is sometimes necessary, together with the addition of organic matter. Silt soils are usually deep and fertile. Examples are the valleys of Hawkes Bay, Rangitikei, Manawatu Plains and other river valleys and flats.

VOLCANIC SOIL

VOLCANIC SOILS have large particles which make the soil open and free draining. They are good for growing but do require additional water and nutrients, and can be improved with the addition of organic matter (compost, peat) which increases their water-holding capacity. Volcanic soils are found in Taranaki, Waikato, parts of Auckland and other volcanic areas.

PEAT SOILS

THESE SOILS occur in low-lying swamp land and are made up of completely decomposed organic matter. They are spongy and porous, holding a lot of water which is easily taken up by plants. Since peat soils are normally low-lying, a lowering of the water table with adequate drainage is usually necessary. Peat soils tend to be acid and of low fertility but this is easily corrected. Peat soils are found on the Hauraki Plains, areas of Southland and other swamp areas.

NUTRIENTS

THE NUTRIENTS needed for healthy plant growth come from the soil. Some of the nutrients are attached to clay particles, others are found dissolved in the soil water. Other nutrients are locked into plant and animal remains which are gradually released and made available to plants as they decompose. As we harvest crops and remove them from the garden we reduce the reservoir of nutrients in the soil which must be replenished in order to maintain healthy plant growth.

ORGANIC MATTER

ORGANIC MATTER is a vital ingredient in maintaining a soil with a good physical condition and includes any material that was once living. It is of benefit to all soils, improving aeration, drainage of surplus water, and water-holding capacity, and allowing better root penetration, and uptake of water and nutrients. All kinds of substances may be added to soil as organic matter including poultry manure, sawdust, peat, bark, straw, seaweed, green manure crops and compost (see the chapter on fertilisers). This material is broken down by fungi and bacteria to form *humus*, a fine black substance. Humus can absorb and hold nutrients and combine soil particles, giving a better soil structure.

Peat is the most concentrated form of organic matter, consisting mostly of sphagnum moss which is a fibrous spongy material. It is virtually sterile and free of weeds and disease. The best quality peat is usually golden brown in colour.

All forms of organic matter are of benefit and should be added to the soil each year.

SOIL ORGANISMS

ALL KINDS of organisms ranging from microscopic bacteria and fungi to insects, slugs and earthworms are commonly found in soil. Bacteria and fungi help break down organic matter and release nutrients, making them available to plants. Earthworms as they burrow improve aeration and drainage and also break down organic matter.

CULTIVATING THE SOIL

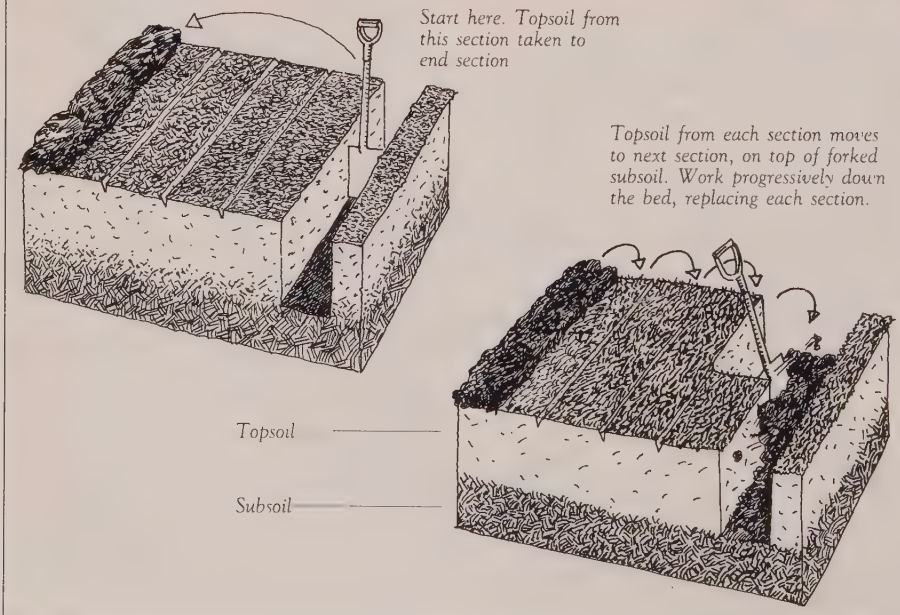
BREAKING UP and turning the soil is known as cultivation, which in the home garden is carried out by digging with a spade or rotary hoe. Cultivation improves drainage and aeration and is also used to control weeds. It is important however to avoid cultivation (especially rotary hoeing) when the soil is too wet or too dry, because under these conditions structure can be broken down.

SOIL STERILISATION

IN ADDITION to there being many beneficial fungi and bacteria in soil, there are some which cause plant diseases. The build-up of these harmful organisms can be avoided if crop rotation is practised, i.e. growing a different crop each year in the same piece of soil. Maintaining good drainage and avoiding saturated soils will also reduce the risk but in areas that have been used for growing vegetables or flowering annuals continuously over a period of time, it is almost certain that there will be a build-up of harmful bacteria, fungi or nematodes.

Soil sterilisation is particularly beneficial in small gardens with limited space to rotate crops. Basamid is a very effective and easy to use product for this purpose.

DIGGING THE SOIL



HYDROPONICS

HYDROPONICS IS a technique of growing plants without soil, an interesting alternative technique for the enthusiast. Hydroponics actually means 'growing in water'. In practice gravel and sand are commonly used, and a solution containing the necessary nutrients flows through the medium. Hydroponics has the advantage of reducing the amount of time needed to produce plants, and enables them to be grown in a confined area.

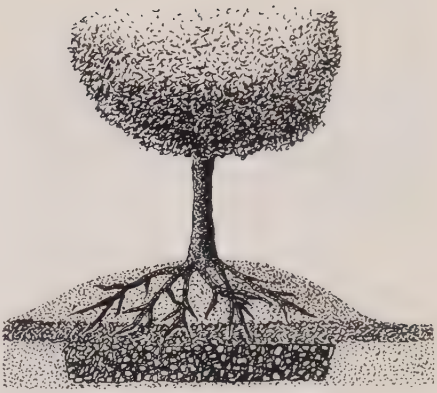
SOIL DRAINAGE

ALL PLANTS require a regular supply of adequate water: too much or too little will adversely affect plant growth and health. Roots need both moisture and air in order to grow: too much water fills up the air spaces in the soil preventing and damaging root growth and making roots subject to disease. Wet soils also tend to be cooler, thus slowing plant growth. Volcanic soils or those with a high proportion of sand will naturally drain freely and do not pose any difficulty. Clay soils suffer from poor drainage.

Improving Drainage

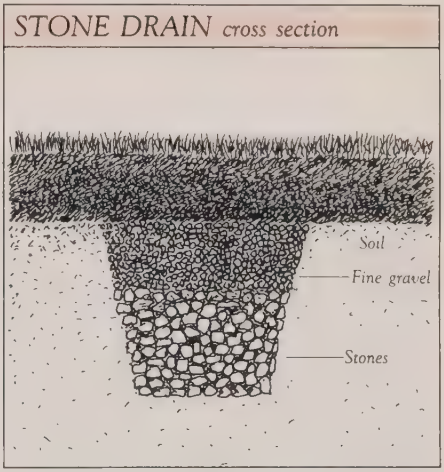
Many drainage problems can be improved by digging in large quantities of bulky organic matter e.g. peat, straw, well rotted compost etc. which help aerate the soil. Drainage may be impaired because the lower soil layers have consolidated into a 'hard pan' below the surface. This can be caused by continual treading, heavy machinery or by the presence of a layer of ironstone or silica. Double digging the area may be the most effective remedy. Alternatively, spiking with a fork may be sufficient to break up the pan and allow drainage.

Another simple way of improving drainage is to raise the planting sites above the surrounding area. Soil in raised beds remains well drained and provides the right environment for roots despite the conditions in the main body of the soil. Beds or mounds can be built up with compost, peat and good topsoil to at least 20 cm above surrounding soil. Raised



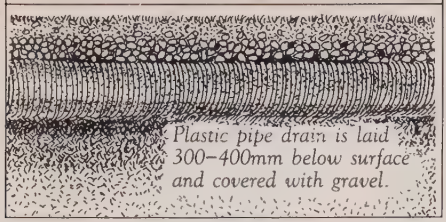
Raised beds can provide good drainage and can be used as a feature

beds also have aesthetic appeal: flat monotonous contours can be relieved and plants given a more prominent display. You can also contour the site so that there are no low-lying areas and all surplus water can run off the surface to an appropriate site. On sloping sites, a rubble drain running diagonally across



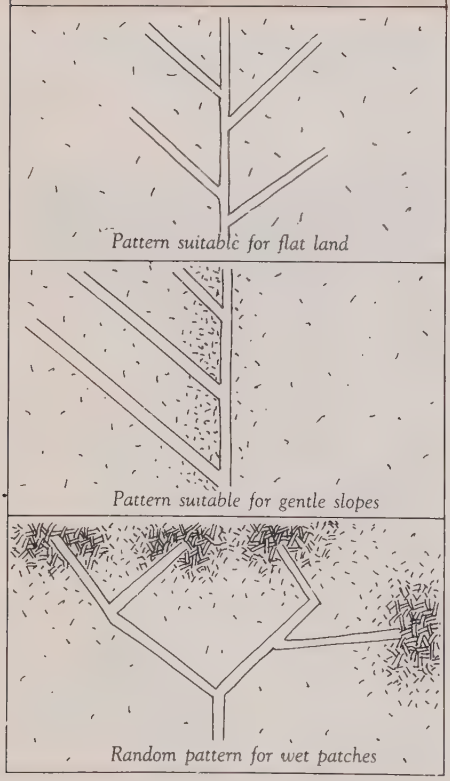
the top of the garden area to direct run-off water or seepage away from the garden is beneficial. Dig a trench 40–50 cm deep, fill with rough stones to a depth of 15–20 cm and cover with gravel and a free-draining top soil. If drainage is a serious problem a drainage system is advisable. Before attempting to install it you should seek advice from a landscape architect or local authority.

PLASTIC DRAIN



Clay or plastic pipes can be used. Plastic drains come in long runs and are perforated at regular intervals with holes. They have the advantage over clay tile drains in that they are flexible, light and easy to handle. Pipes are laid at the bottom of a carefully graded trench 30–40 cm deep and covered with gravel to allow water access. Most frequently used in the home garden is the herringbone system. This involves a number of side drains which flow into a central drain.

DRAINAGE PATTERNS



WATERING

LACK OF MOISTURE is one of the most critical factors affecting plant growth. Wilting or leaf drop is the first obvious sign that plants are suffering from lack of water. However, long before any visual symptoms appear a plant can be suffering from water stress which can severely restrict and limit its growth. How much and how often a plant needs watering depends on the soil type, kind of plant, size of plant, climate and time of year.

Factors that influence watering are:

Seedlings
It is most important to water seedlings until their root systems are well established. Vegetable plants such as lettuce, cabbage and beet all need unchecked growth. If they dry out, the plants are likely to bolt, i.e. run to seed prematurely.

Foliage
The more foliage a plant has, the more water it will lose. Tomatoes when fully grown under hot conditions may need watering twice daily. Pumpkins and cucumbers, because of their larger leaves, are also prone to water stress.

Wind
Wind greatly increases transpiration and therefore water loss from plants. During hot, dry, windy conditions, plants have a greater demand for water.

Fruit Development
Most vegetables and fruits require extra water to increase in size. Lack of water after fruit is formed will cause fruit to be undersized, dry and tasteless, and under adverse conditions it may drop.

CONSERVING WATER LOSS

MULCHING WITH peat, bark, compost or black polythene will help conserve moisture. A layer at least 2–3cm thick is needed to protect surface roots and prevent water being evaporated from soil surface. A mulch also helps suppress weeds which will compete with plants for water. Early morning or late afternoon

are the best times for watering as high evaporation rates are likely in the middle of the day. Foliage should dry before nightfall, however, to avoid disease. A good soaking encourages deep rooting and soil stays moist for a long time. Wiltpruf, a natural pine oil, can be sprayed onto foliage to cut down water loss without interfering with growth. This product greatly aids survival of plants when transplanting seedlings, trees and shrubs in hot dry or windy weather. Wiltpruf can be used on indoor plants to reduce water loss so plants can be left for several weeks without water. This is particularly valuable over holiday periods.

METHODS OF APPLYING WATER

THERE ARE a number of methods for applying water in the home garden. Your choice will depend on the amount of time you have available and how important the efficient use of water is to you and your situation.

Most gardens get their water from a hose, either hand-held or with a sprinkler attachment. There are many types of hose to choose from. Reinforced hoses are hardier and longer lasting, and some have a radial design for added strength. There is a range of hose nozzles which give different spray patterns, depending on the intended use. In addition there is a wide selection of hose-end sprinklers available.

Applying water with a hose is in fact very time-consuming and clumsy. It is difficult to get an even application and hosing is not very efficient, since less than 50% of the water is actually absorbed by the plants.

Soak hoses with small holes in them about 30cm apart are useful when water is required in a strip rather than at a point.

Irrigation systems are now available to the home gardener which greatly increase the efficiency of water use and application. The latest developments for efficient watering are Micro-irrigation systems, which apply water regularly in small amounts, keeping water loss from run-off and evaporation to a minimum, and supplying water to the plants as they require.

The Plassay Home Irrigation system consists of a range of components which are all easily assembled and put together and can be adapted to individual garden requirements. The Plassay system includes a range of micro-sprinklers, timers, both automatic and manual, pressure reducing valves, filters, isolating valves, tubing and fittings, drippers and pop-up sprinklers. The systems are easily installed, require minimum maintenance and result in efficient watering. The types of irrigation can be divided into three categories:

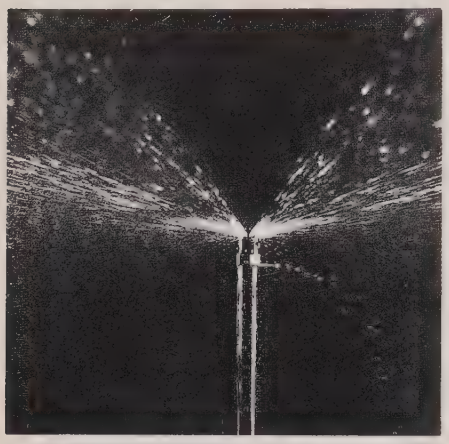
Drip System

'Drip irrigation' drops water onto the ground through an emitter beside each plant. A small amount of water is applied to the root area, on a constant basis, as the plant needs it. This results in a highly efficient use of water (90–95%). Weed growth is not encouraged, because no extra ground is watered. Drip systems are suitable for trees and shrubs, hanging baskets and potted plants. The Plassay dripper is a 'variflow' emitter, where the water supply can be varied from a drip to a continuous flow. This allows for seasonal adjustments as well as for those for individual plants.



The Variflow dripper: water can be varied from drip to continuous flow

Micro-Jets
Micro-Jets are suitable for flowerbeds and gardens where the density of plants is too impractical for drippers. Quarter, half and full circle spray patterns are available, allowing for flexibility with planning. Micro-Jets result in about an 85% watering efficiency.



A Microjet spray pattern

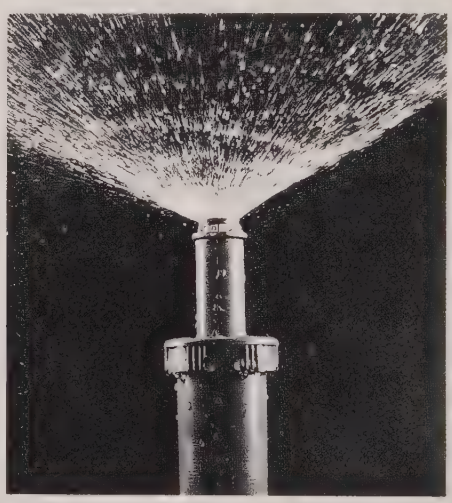
Micro-Sprinklers
Micro-Sprinklers are suitable for areas around the home where a large spray pattern is needed. Under the normal town supply water pressure, a spray diameter of 7 metres can be obtained. A spinner in the sprinkler ensures a gentle watering.



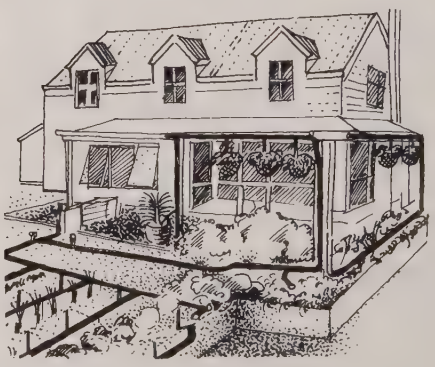
Microsprinklers give a full circle spray pattern suitable for large areas

Pop-Up Sprinklers
Pop-up sprinklers have been particularly designed for lawns, where sprinklers and pipe work are hidden below the ground when not in use. When the water is turned on, the resulting pressure causes the nozzle to pop up, and it retracts out of sight again when the water is turned off. This keeps lawns uncluttered, eliminating possible injury and making mowing easy. Sprinklers are available in full circle, half circle and quarter circle patterns.

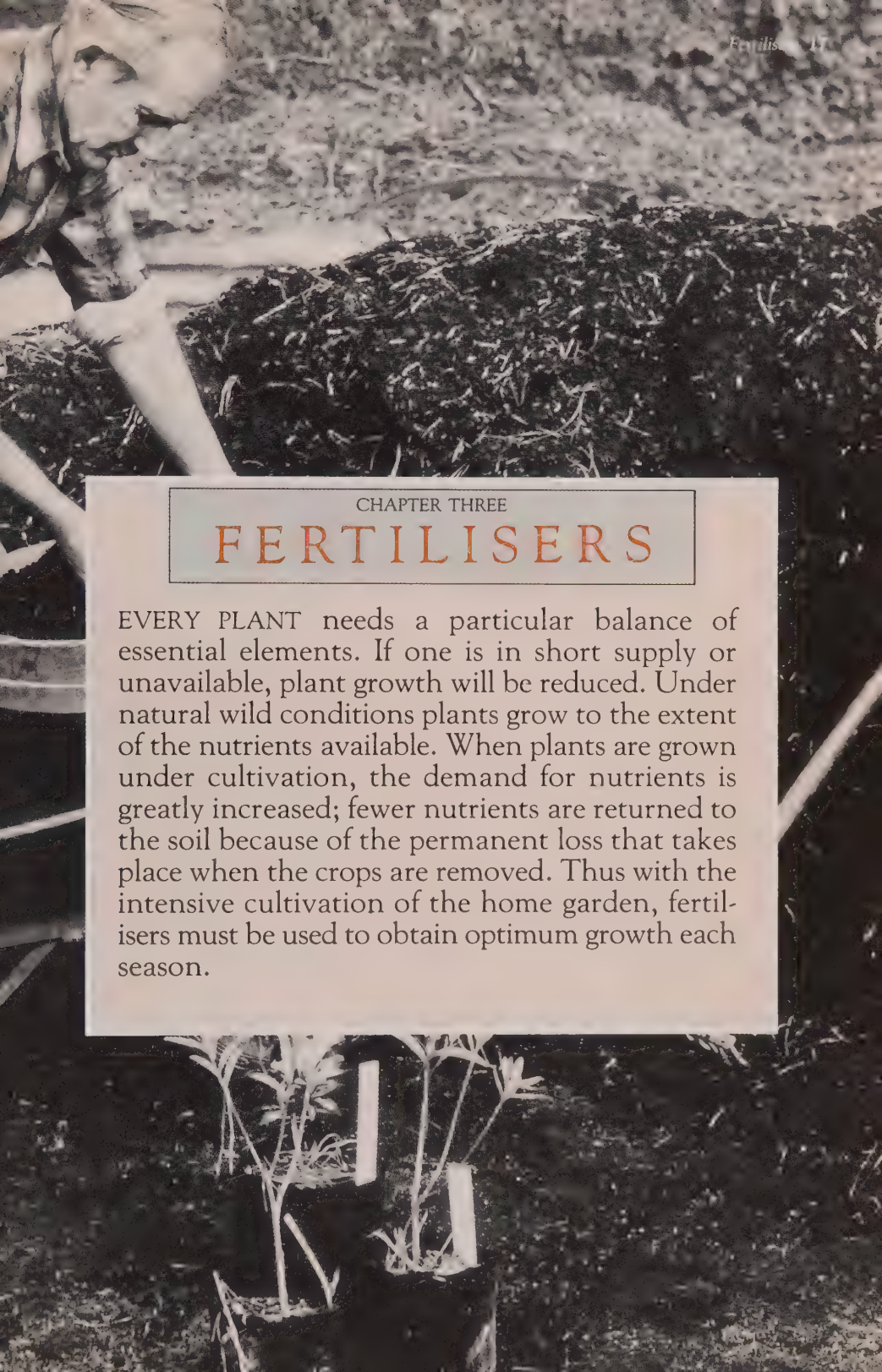
For further information on parts available and installing a Plassay irrigation system, ask at your local garden centre for one of the comprehensive Plassay 'How to do it' brochures.



The Pop-up sprinkler in action



A home and garden plan for efficient, low maintenance watering



CHAPTER THREE

FERTILISERS

EVERY PLANT needs a particular balance of essential elements. If one is in short supply or unavailable, plant growth will be reduced. Under natural wild conditions plants grow to the extent of the nutrients available. When plants are grown under cultivation, the demand for nutrients is greatly increased; fewer nutrients are returned to the soil because of the permanent loss that takes place when the crops are removed. Thus with the intensive cultivation of the home garden, fertilisers must be used to obtain optimum growth each season.

MACRO NUTRIENTS are those required in relatively large quantities. These elements are nitrogen phosphorus, potassium, calcium, magnesium and sulphur.

Micro nutrients, or trace elements, are also essential for plant growth but required in minute amounts. These elements are iron, chlorine, copper, manganese, zinc, molybdenum and boron. If one is deficient it may cause a severe abnormality in growth (e.g. whiptail in brassica crops is caused by deficiency of molybdenum). If a trace element is present in too high a concentration it may be toxic to the plant or lock up other elements. The correct balance is essential.

TYPES OF FERTILISER

A FERTILISER is anything that can be used to supply nutrients to plants. There are two broad types: *organic*, which are derived from plant and animal remains and are often referred to as *manures*; and *inorganic*, which are manufactured from chemical reactions and are usually a more concentrated form of nutrient. Plants obtain the nutrients they need in the form of ions dissolved in soil water, which are derived from both manures and inorganic fertilisers.

Organic manures help to improve the physical condition of the soil by improving the structure, micro-organism activity and the water-holding capacity of soils. The nutrient content can vary considerably according to the age of the manure, the origins of the materials and the conditions under which they are stored. Generally their nutritive value is low. Micro-organisms are required to break the compounds down and make the nutrients available to plants. In cold weather this may be a very slow process.

Manufactured inorganic fertilisers provide nutrients which are readily available to plants and they give quick

THE EFFECT OF MACRO NUTRIENTS ON PLANTS

Nutrient	Plant Use	Deficiency Effects	Excess Effects
Nitrogen (N)	Protein-building, photosynthesis, cell extension (i.e. growth)	Stunted plants, small pale leaves, thin stems	Soft, succulent growth in leaves and stems, lack of flowers and fruit
Phosphorus (P)	Photosynthesis, production of flowers and fruit	Poor root growth, stunted plants, purple or bluish leaves	
Potassium (K)	Photosynthesis, respiration	Leaves look scorched at edges, few flowers, fruits with poor flavour and colour	Slow, hard growth, dark green colour
Calcium (Ca)	Sturdy growth	Flowering buds wilt and die, growing tips die, growth stops	
Magnesium (Mg)	Production of chlorophyll	Yellow pattern between the veins of the leaves	
Sulphur (S)	Production of chlorophyll	Leaves turn light green or yellow, especially new growth. Small leaves	

plant growth. They are a concentrated form of nutrient. For example, 100 grams of a General Garden fertiliser is roughly equivalent to 3kg of organic manure per square metre, in nutrient content.

Ideally, a combination of both manures and fertilisers should be used. Organic manures improve soil structure and as a bonus will release a small quantity of nutrients over a period of time. Manufactured fertilisers provide the bulk of nutrients which are readily available.

Complete fertilisers contain nitrogen (N), phosphorous (P) and potassium (K) (the three major nutrients). The proportion in which these are present in the fertiliser is usually stated on the outside of the pack, e.g. Lush has an NPK ratio of 10–3–6 which means there is 10% of the pure element nitrogen available to the plant, 3% of the pure element phosphorous and 6% of the pure element potassium.

An *incomplete* or simple fertiliser contains only one (or perhaps two) of the major nutrients (e.g. urea which contains 46% nitrogen). In most instances it is safer and more convenient to use a

ORGANIC MANURES				
Type	N%	P%	K%	Remarks
Poultry	2–4	1	0.5	Low in organic matter. Relatively high in nitrogen content which may cause excessive leaf growth. May burn seeds and plant roots. Slightly alkaline. Apply 270–400g/square metre.
Sewage sludge	2	1	0.25	Useful form of organic matter. Nitrogen content not readily available.
Fresh seaweed	0.4	0.1	1	Decays rapidly in the soil. Use fresh or composted. Apply 3–5kg/square metre.
Sawdust				Can be used to build up the humus content in the soil, or as mulch. Fresh undecomposed sawdust temporarily robs the soil of nitrogen. Sawdust from treated timber contains preservatives which may be toxic to plants. The NZ Forest Service have issued a warning outlining the health risk from using ash from wood treated with c c a (copper chromate arsenate), which has a green colour, on vegetable gardens.
Compost				Highly variable, depending on components.
Peat				Absorbs water readily and is a good medium for biological activity. Used mainly to condition soils or as a mulch to conserve and hold moisture. Apply 3–5kg/square metre.
Manure from horse, cow, sheep or pig	0.5	0.2	0.1	Highly variable. A good source of organic matter.
Wood ash			1.0	Provides potash but virtually no other elements. Ash from treated wood will have same toxicities as sawdust from treated wood. Apply 270g/square metre.
Coal ash				Extremely variable in chemical content, which can cause nutrient imbalances and interactions in plant growth. Should not be used.

complete balanced fertiliser. Too much of one nutrient can affect the uptake of others or may damage the plant. A plant grows best when all the nutrients it needs are adequately supplied in balance.

APPLICATION OF FERTILISERS

FERTILISERS SHOULD be applied to plants just before or when they are actively growing, flowering or fruiting. Ideally, the soil is moist and contains compost, peat or other forms of organic matter. Keep the fertiliser well away from the foliage and the trunk of trees. Always apply at recommended rates for soil types and stage of growth and age of plants.

INORGANIC FERTILISERS				
Complete fertilisers	N%	P%	K%	Remarks
Gro-Plus Azalea, Camellia and Rhododendron	4	4	4	A balanced fertiliser for acid-loving trees and shrubs – azaleas, camellias, rhododendron, ericas, daphnes, gardenias, kalmias and hydrangeas. Nitrogen is present in both slow-acting organic form and as fast-acting nitrates. The iron content retains the correct soil acidity for acid-loving plants. Prior to planting apply 100 g/square metre and repeat again each spring and autumn.
	Other element: Iron			
Gro-Plus Bulb Food	2	6	4	A fertiliser blended for bulbs with a high phosphorus content. Prior to planting apply at a rate of 100g/ square metre and in equal amount around established plants.
Gro-Plus Citrus Fertiliser	7	7	5	A balanced fertiliser to suit the demanding citrus and subtropical fruits, tamarillos, feijoas, kiwifruit, babaco, passionfruit. The nitrogen is present in both the slow-acting organic form and fast-acting nitrate form. In addition it contains magnesium, an important nutrient for the development of chlorophyll in leaves of citrus. Apply 200g per hole when planting and 0.5kg–5kg per tree each year. Spread evenly over the root zone area (approx 0.5 metre beyond the drip-line of outermost leaves).
	Other element: Magnesium			
Gro-Plus General Garden	6	6	5	A balanced, all-purpose fertiliser for vegetables, flowers and fruit trees. It contains chelated trace elements. As a base dressing apply 150–250g/square metre. As a side dressing 50g/ square metre.
	Other elements: All required trace elements			
Gro-Plus Lawn Fertiliser	13	2	0	A balanced fertiliser for lawns with a high nitrogen content to promote dense leaf growth. The iron content produces a deeper leaf colour and promotes fine grass species, discouraging coarse grasses, weeds, worms and moss. Apply at a rate of 30g/square metre when sowing seed and in the spring and autumn on established lawns.
	Other element: Iron			
Gro-Plus Rose Food	5	4	9	Especially blended for roses with a higher potassium, magnesium and iron content to encourage perfection in blooms. Prior to planting apply at a rate of 250g/square metre and for established plants at 100g/ square metre.
	Other elements: Magnesium Iron			

Base dressings are applied before planting or sowing. Broadcast fertiliser evenly over the area and fork or mix thoroughly into the top 5–8mm of soil.

Side dressings are supplementary to base dressings and are applied to growing crops usually to make up for any shortage of nutrients in the soil or to supply nutrients at a vital stage of growth: e.g. as cabbage starts to form its heart it needs extra nitrogen and a side dressing of sulphate of ammonia or Lush can be applied.

Maintenance dressings are applied regularly to permanent plantings such as ornamental trees and shrubs, roses, fruit

INCOMPLETE FERTILISERS

	N%	P%	K%	Remarks
Gro-Plus Blood and Bone	6	7	0	Natural, organic form of nitrogen and phosphorus. Requires action of soil organisms, which are most active in warm soils, to release nutrients. Incorporate well into the soil. Prior to planting apply at a rate of 200g/ square metre and around established plants 50g/square metre. (Note – Blood and Bone contains no Potash.)
Gro-Plus Sulphate of Ammonia	21	0	0	Used to replenish nitrogen levels in soils. Suitable for high rainfall areas as the ammonium form of nitrogen is not easily leached from soil. Prior to planting apply 50g/square metre. Around established plants 10–20g/ square metre on lawns 20 to 30g/ square metre. Often used for leafy vegetables such as lettuce, cabbage. Other element: 24% Sulphur
Gro-Plus Sulphate of Potash	0	0	40	Sulphate of potash (potassium sulphate) is a quick-acting source of potassium used to encourage firm vegetative growth and improve the texture and colour of flowers, leaves and fruit. Often used to encourage flowering of bougainvillea etc. Also used to harden winter glasshouse tomatoes. On new ground apply 40g/ square metre and on established gardens 20g/ square metre. Other element: 18% Sulphur
Gro-Plus Superphosphate	0	10	0	Phosphates are particularly important in flower, fruit and seed production. NZ soils tend to be naturally deficient in phosphates and crops continually remove it from soils. Prior to planting apply 250g/square metre and around established plants 100g/sq.m.

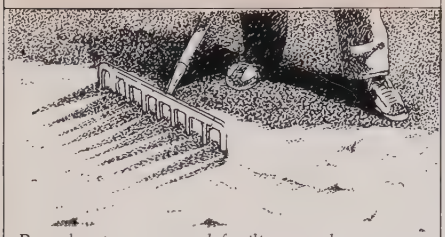
FERTILISER LABELS

Gro-Plus fertiliser labels show percentages of the 3 major nutrients



trees and hedges to maintain nutrient levels. The fertiliser should be spread evenly over the root zone (which extends approximately half a metre beyond the dripline of the outermost leaves) and watered into the soil.

APPLYING FERTILISER



Base dressing – spread fertiliser evenly over area, mixing into topsoil.



Side dressing – apply alongside growing plant 5cm deep, and work into soil.

PROBLEMS

A BALANCE of nutrients is important. High applications of one particular nutrient may disrupt normal growth patterns of the plant: e.g. large quantities of a nitrogenous fertiliser applied to tomatoes or other vegetables will encourage excessive vegetative growth with little production of fruit. To avoid this problem a balanced NPK fertiliser is safer to use. Remember fertilisers coming in direct contact with the plant tissue will cause burning.

Excessive applications of fertiliser can raise the salt concentration in the soil above that in the root tissue. This may reverse the water movement and result in water moving from the root to the soil, causing plants to wilt and leaves to brown or burn along the margin.

Highly soluble fertilisers like sulphate of ammonia are most likely to cause problems. Granular fertilisers are less likely to burn leaves from contact, but can still burn through the roots if applied in excess. Slow release fertilisers are unlikely to cause burning problems. Injury can be avoided by applying the correct amount and mixing the fertiliser thoroughly with the soil and watering it in.

LIQUID FERTILISERS

FEEDING PLANTS with liquid fertilisers is the most direct way of giving them essential nutrients and prompts a quick growth response. They are also clean, easy, convenient and ideally suited for house plants and container plants. In potting mixes there is very little, if any reserve of nutrients; it is therefore important to feed potted plants regularly with a balance of nutrients that closely resemble their requirements. They can be conveniently applied at each watering, supplying a little nutrient regularly as the plant requires it.

Liquid fertilisers are available in liquid form or as water soluble powder, the latter being more economical.

Liquid Lush is a general formulation which suits vegetables, flowers, fruit trees, indoor plants and container plants.

Foliage Indoor Plant Food promotes healthy vigorous vegetative growth which is required to keep foliage plants in prime condition.

Flowering Indoor Plant Food ensures perfection in flowers, improving both the quality and quantity of blooms.

Orchid Food for Growing Plants is formulated to give optimum vegetative growth to young orchids and to promote recovery after flowering on mature plants.

Orchid Food for Flower Promotion enhances the quality and quantity of flowers, providing the essential balance of nutrients during the flower initiation and flower production phase of the orchid plant.

Powdered Lush is a complete, balanced, soluble food. It ensures healthy and vigorous growth, remedies deficiencies quickly and is very economical.

GRANULAR FERTILISERS

THESE ARE clean and easy to handle and

do not set hard in storage. They are usually strong, and care should be taken with the rate of application.

SLOW RELEASE FERTILISERS

SLOW RELEASE fertilisers are in the form of pellets which slowly dissolve in the soil water, releasing the nutrients and making them available to the plant over a period of time. They are ideal for low maintenance situations and especially suitable for container-growth plants. They are safe to use and are not likely to burn the plant. The Slow Release Indoor Plant Feeders have a N.P.K ratio of 10–4–8 plus 2% magnesium.



Slow release fertiliser pellets release nutrients into the soil over a period of time.

SEAWEED EXTRACTS

SEAWEED EXTRACTS contain natural growth regulators, auxins, gibberillins and cytokinens which contribute to growth responses. They are *not* fertilisers and contain very little, if any of the essential elements required for growth. However, they are excellent plant tonics and improve the uptake and movement of nutrients within the plant.

Sea Magic
Sea Magic is a concentrated natural organic seaweed extract prepared from sea plants by a cold extraction process which preserves the growth regulator properties.

FOLIAR SPRAYS

THE MAJORITY of nutrients enter plants via the roots, but trace elements are very effectively absorbed through the leaves. Where lack of a trace element has been a limiting factor, dramatic results can be obtained by using a spray. Trigger Leaf feeder can be particularly useful for increasing humidity where plants are exposed to dry air indoors, or when transplanting seedlings, when their ability to absorb water and nutrients through the root system is temporarily impaired.

GREEN COVER CROPS

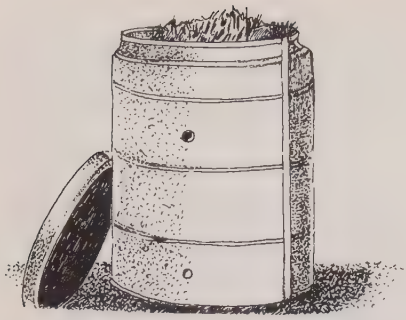
GREEN COVER crops are a convenient way of adding organic matter to the soil and improving soil structure. They are most common in the vegetable garden. Wheat, barley and oats are all suitable. Mustard is useful as it is quick maturing. Legumes such as lupin which add nitrogen through the nodules on their roots are also popular.

Broadcast seed at 30–60g per square metre in the autumn and dig in the spring. The plants should be turned under the soil completely but not too deeply, and kept moist.

COMPOSTING

COMPOSTING IS not only an ideal way of using and recycling home and garden waste, but is an invaluable addition to the garden soil. Mature compost mixed thoroughly with the top soil or applied as a mulch on the soil surface around plants has many benefits. They include: recycling nutrients, aerating clay soils and improving drainage, helping bind sandy soil, keeping roots cool and moist in summer, preventing soil compaction, encouraging important bacterial growth, preventing nutrient leaching, suppressing weed growth, retaining soil moisture, encouraging worms, insulating roots against cold frosty conditions, and creating ideal soil consistency for root growth.

Composting is a method of speeding up the natural decomposition of rotting organic matter by bringing large quantities together. It requires a variety of organic matter (vegetable scraps, lawn clippings, leaves etc.) oxygen, moisture and nutrients.



Portable plastic compost bins make composting tidier and simpler.

Traditionally compost in the home garden has been made in open heaps or a series of wooden boxes. They have tended to be untidy and often smelly and attractive to flies. Today with the advent of portable plastic bins, composting is tidier and simpler. If you simply add a variety of materials gradually to the bin and supply water when necessary, the compost will look after itself. Depending on air temperatures, the finished compost will be ready in 6–12 months. However, this time can be reduced (down to six weeks) in warm weather with frequent turning to improve aeration and reduce the size of the particles. (Small tree branches and dead plants need to be shredded to pieces shorter than 5–10cm.) Thick layers of material which are likely to mat will result in poor aeration and should be avoided.

Hundreds of micro-organisms, mostly bacteria and fungi, are involved in the breakdown process. There are ample numbers of microbes present in the air and on plant material for composting to start, and accelerators are not necessary. The micro-organisms require a continuous supply of oxygen. For composting to be rapid, 50% of the volume of the compost should be air. This can be achieved by frequent turning and fluffing up of the compost. The best moisture content is at least 50%. The compost should be damp but not soggy. Nutrients can be supplied by adding materials of different composition, and fertilisers. The addition of any fertiliser will speed up decomposition. Gypsum and superphosphate will in addition reduce undesired odours. Lime is generally not necessary and will only result in increased losses of nitrogen from the compost. Material at the bottom of the heap will be ready first. When a bin is full, the most recently added material should be used to 'start' a new compost. Two bins allow for continuous composting. Twenty bins of loose organic matter make approximately one bin of good compost. A good compost is brown and black in colour, crumbles in the hand and smells sweet.

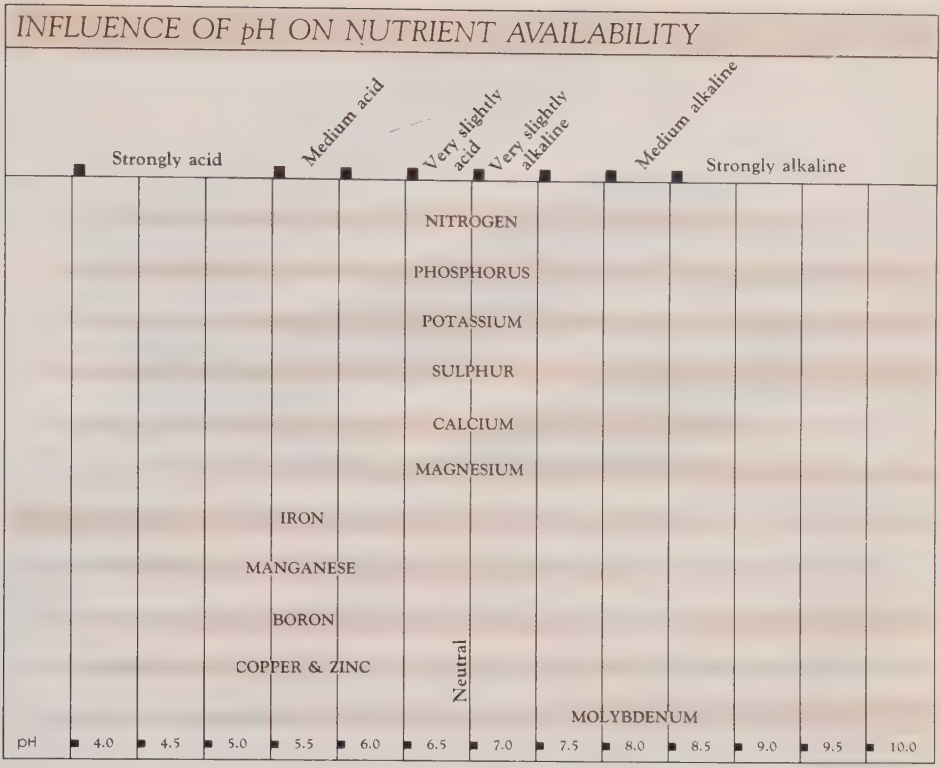
SOIL ACIDITY

SOIL IS often referred to as either 'sweet' or 'sour'. Sweet soils are alkaline and sour soils are acid. A scale of measurement has been devised, called the pH scale, which measures acidity and alkalinity: it ranges from 1 to 14, 1 indicating strongly acid, 7 neutral and 14 strongly alkaline. Soils usually range from 4 to 8. The acidity or alkalinity of the soil determines the availability of nutrients in it and the ease with which they can be taken up. Between pH 6 and 7 (slightly acid) most nutrients are available in the soil and most plants thrive. Below 5.5 and above 7.5 problems begin to occur for many plants. In an alkaline soil above 7.5, phosphate, potassium, manganese, iron and many trace elements become less available to plants. In an acid soil below 5.5 phosphate, potassium, calcium and magnesium become less available.

How Soil pH Affects the Availability of Nutrients

Measuring pH

There are a number of soil testing kits available to the home gardener which measure pH. If the tests are repeated with a range of samples over a period of time they can be used as a guide, but they cannot be absolutely relied on. A commercial test should be obtained for accurate result and fertiliser recommendation. These are available, at a cost, from a number of laboratories including Analytical Services Ltd. in Cambridge or the Cawthron Institute in Nelson. Some garden centres have their own pH meters and offer a free testing and advice service.



In practice, in the home garden, soil acidity or alkalinity is not a major problem. Many garden books and soil test kit instructions provide a long list of plants, with optimum pH levels for each. In fact as we have seen most plants grow very well over a fairly wide range of pH (5.5 to 7) which most soils would fall into. Peat soils and clays may be below this, and need adjusting. Gardens which have a lot of organic matter (peat, compost) added may become acid over time and also need adjusting.

Correcting Acidity

Acid soils occur naturally in areas with high rainfall. Soils will tend to become acid (or sour) as calcium is removed by crops or is leached away with water. Acids are also formed during the decomposition of organic matter. Acidity can be corrected by the application of lime. The most common form is garden lime, which is also known as ground limestone or calcium carbonate. It is the most convenient form of lime to use as it does not react with fertilisers. There is also trace mineralsed lime, that is, garden lime with trace elements added.

Dolomite lime contains 10% magnesium as well as calcium and is useful when this element is deficient.

Hydrated lime or slaked lime (calcium hydroxide) is quick-acting, but can react chemically with some fertilisers.

Gypsum (calcium sulphate) is often used as a soil conditioner, and where calcium is needed. It is neutral, however, and does not affect the soil pH. It is commonly used on azaleas, rhododendrons and camellias and other acid-loving plants.

The amount of lime to be used depends on the existing pH, the amount of organic matter present and the type of soil. Sandy soils require less lime than clay soils. The following quantities of garden lime are a guide to annual applications suited to a flower or vegetable garden.

Soil Type	*Amount of Garden Lime*
Sandy	150–200g/square metre
Loam	200–280g/square metre
Clay	280–450g/square metre
Peat	280–450g/square metre

The initial application of lime to a new garden should be at double these quantities. Lime can be applied at any time of the year but its effect is most rapid when it is finely ground and mixed thoroughly through a warm, moist soil. It is usually most convenient to apply it in autumn or winter, preferably two to three weeks prior to other fertilisers.

Correcting Alkalinity

Alkaline soils occur naturally in low rainfall areas, due to the build up of salt in the soil. They also occur in areas where there are heavy deposits of shells or where there have been excessive applications of lime or potash. The addition of organic matter such as peat or leaf mould is usually sufficient to lower the pH. Alternatively, aluminium and iron sulphates or sulphur can be used. Azaleas, rhododendrons, camellias and lawns prefer acid conditions and may need adjusting.



CHAPTER FOUR

GARDEN TOOLS

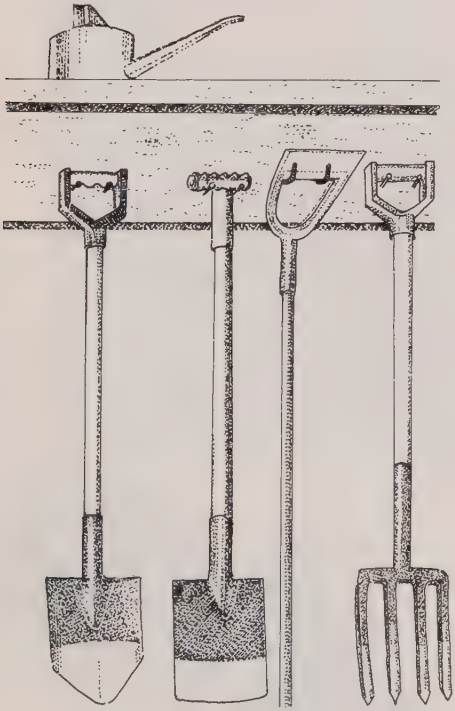
SELECTING THE right gardening tools is most important. Having the right tools for each job saves time and effort and results in better care of your plants.

It is good policy to purchase the best tools you can afford. Quality tools, properly cared for and used for the correct job, can last a lifetime.

SPADES, FORKS and secateurs made of forged steel are stronger and more durable than those which are pressed.

Purchase established brands of tools where quality can be assured, e.g. True Friend, which are made in West Germany. Should your budget be limited, it is advisable to settle for a lower-priced tool of a well-known brand where the quality of the steel used has not been compromised. Good quality cutting tools are less likely to get out of alignment and if they do, their tension is often adjustable.

Choose tools which are comfortable for you to use. Make sure they are the right length and that the style of handle suits. Always check that spare parts are readily available (such as anvils, blades, springs etc.) and that the tools carry some form of guarantee. This is especially important when purchasing electrical tools.



SHOVELS

SHOVELS ARE suitable for digging and shifting quantities of soil. Keep the front of the cutting edge sharp, to allow the tool to bite into the soil.

Long Handle, Round-Point Shovel
Used for digging and scooping. The straight shank gives added strength and enables easy digging of ditches, gutterings and planting holes.



Long Handles/Short Handle, Square-Point Shovel
Suitable for levelling pathways, squaring off the bottoms of ditches, and shovelling manure and snow.



D-Handle Shovels
Suitable for moving soil, sand, gravel and for picking up litter. Round point and square point models are available.

Gardening Shovel
Lighter and smaller than the regular shovel. Suitable for edging, cultivating and digging holes around the home.



SPADES

SPADES GENERALLY have short handles and can be used for digging, trimming and wrenching trees and shrubs. With spades, sharpen the back of the blade.

Square-End Spade
Commonly used for edging, digging and cultivating. Use with a chopping motion to break up earth clods. Choose a comfortable weight and size for the job involved. Handles can be steel or wooden.



Drainage Spade
A long slim spade designed for digging trenches and drains.



FORKS

THERE ARE different types of garden forks for specific uses.

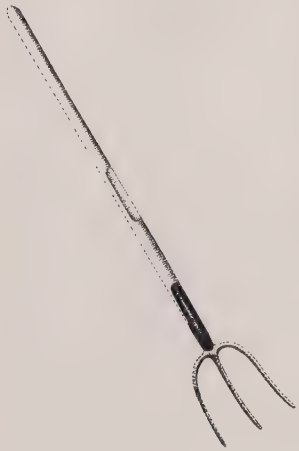
Spading Forks
These are the most common type of fork, suitable for breaking up soil, digging in heavy clay or rock soils, and lifting delicate plants where it is important not to damage the root system.



Border Fork
These are forks suitable for light digging and ideal for picking up weeds, leaves etc.



Manure and Hay Forks
These forks have long curved prongs which make them suitable for moving garden prunings, long weeds, manure and other loads of materials that hang together. Ideal for turning compost.



TROWELS

A BASIC item for any gardener. Used for weeding and shallow digging, planting bulbs, annuals, vegetables and small perennials. A straight shank (A) is good for digging and planting; the drop shank (B) is more suitable for surface cultivation.

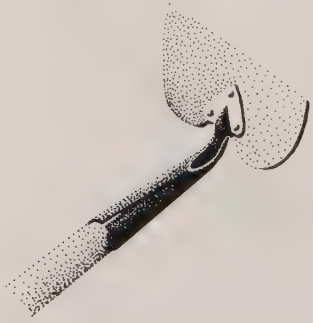
Transplanting Trowels
These have a narrow, deeply curved blade which is useful for transplanting seedlngs and lifting small plants. Available with both long and short handles.



HOES

THESE PERFORM many gardening functions from cultivating, digging furrows or hills, to destroying weeds and breaking up crusted soil. A hoe should be kept sharp and should be light and comfortable to work with.

Swan-Neck Hoe
A wide hoe and the most common. The flat front edges cut weeds off at ground level and the sharp corners work like a small pick.



Push-Pull Hoe
Designed to scrape the soil surface, cutting off seedling weeds and breaking the soil crust. They can be torpedo shaped (A) or flat disc shaped (B). Different sizes are available for hoeing between rows or among plants. Both front and back edges should be sharpened as the backward motion is ideal for removing large weeds using a hook and pull action.

When hoeing, try to work backwards to avoid walking on soil just cultivated, and tramping weeds back into the earth. If possible work from a path.



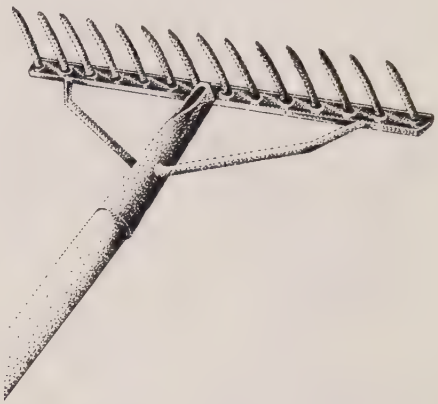
RAKES

RAKES HAVE a number of uses, and there is a variety of models available, each suited to different tasks.

Level-Headed Rake
The most common rake, which is suitable for levelling off after digging, firming down soil before planting seeds, filling in rows after planting seeds, covering grass seed, mixing fertiliser into the soil and raking up weeds and rubbish.



Garden Nail Rakes
A heavier rake made of long, heavy nails. Is used for clearing out lawn thatch and cutting long, surface runners of certain lawn grasses. Pull strokes gather debris toward the user and push strokes clear material from the blades. The rake should not be lifted from the ground.



Lawn Rakes
Available in steel, plastic and bamboo. They are built to be light and springy and are used for raking up lawn clippings, leaves and other light matter on both paved and natural surfaces. When using, draw the rake towards you using the full length of the handle. The rake is likely to break if used in a sweeping motion like a broom.



Cultivators
Used for breaking up hard soil around plants and weeding. Of particular value when cultivating among growing crops. Most efficiently used with a combined chopping and pulling motion. (They are not suitable for deep cultivating or on large areas which are more suited to rotary hoes.)



COMPOST BINS

WITH THE advent of portable plastic bins, composting has become much tidier and simpler. These bins are made of stabilised polyethylene, which is resistant to sunlight, and have holes for aeration. They are usually made in a dark colour which absorbs heat and hastens decomposition of compost. The Little Rotter model comes in two interlocking sections which can be lifted separately from the base allowing the compost to be shovelled from underneath. This model is particularly easy to transport and store as it takes up less room when dismantled.



PRUNING TOOLS

MOST HOME gardeners can manage with three basic implements for pruning efficiently and effectively:
- Secateurs/pruners, for smaller twigs, stems or spent flowers.
- Hand loppers, for wood up to 4 cm thick.
- Pruning saws, for cutting larger limbs and branches.

If you attempt to use one tool for all thicknesses of wood, rough bruised cuts will result and the implement is likely to be damaged.



Secateurs/Hand Pruners
Secateurs or hand pruners are designed for cutting wood up to 2 cm thick. There are a number of models available. Points to consider before making your choice are: availability of spare parts such as anvils, blades and springs; the presence of a sap groove, so that the blade is self cleaning (this is important when working

with plants with a high sap content); whether the grip is comfortable and the right size for your hand, with plenty of spring action so that work is less tiring.

There are two main types available: a scissor style, which has sharpened blades which overlap, giving a close, clean cut; and the anvil style, which has a sharpened top blade that snaps onto a flat plate of softer metal.

The choice of style is largely a matter of personal preference. However, the anvil type tends to crush the bark on the anvil side and is therefore more suited to harder woods and winter pruning. The scissor styles cut from above and below the branch which is an easier action and generally suited for soft woods and summer pruning jobs.

Fruit pruners-pickers are specialised tools used for cutting the stems of fruit, such as citrus and grapes. The curved blades allow for close access to the fruit without damaging it. Plier-style handles enable the user to apply a high cutting pressure on tough stems.



Loppers

Loppers can be used for cutting wood up to 4 cm thick. The long handles give a greater reach which is advantageous with tall trees and shrubs or those with thorns, and added leverage, resulting in greater cutting strength.

Some models have shock absorbers which reduce jarring as the blades come together. Loppers are available in anvil or scissor styles with wooden or aluminium handles. They come in different lengths and weight, depending on individual requirements.

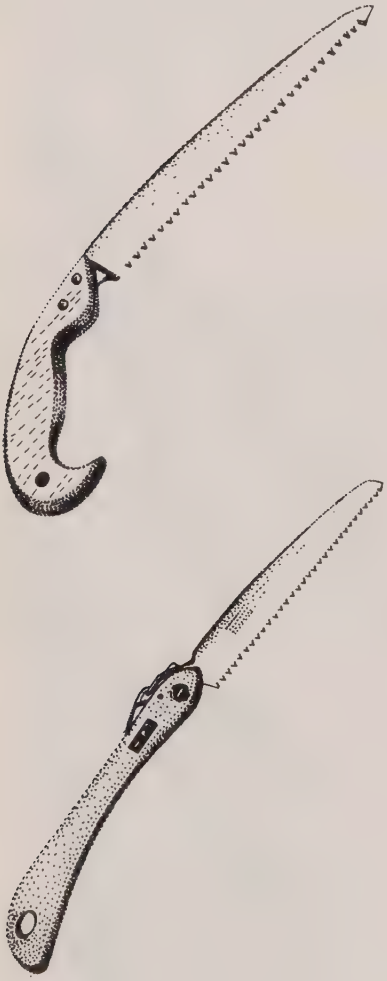
For heavy pruning, double-lever loppers are available which have greater cutting ability, allowing the user to put more power into the cut.



Pruning Saws

Saws are used for heavier work and larger wood. Small pruning saws have a narrow back with cutting teeth on a curved blade which allows work in confined spaces. The main cutting action is on the pull, rather than on the push stroke, as is the case with straight saws, which makes it easier to use for overhead work.

For heavier pruning choose a saw with a greater number of points to the centimetre. Some models have safety locks and can be folded for convenient storage and transportation.



Hedge Shears

Hand hedge shears have long scissor-like blades for trimming and shaping bushes. Those with serrated or notched blades hold the foliage, enabling easier cutting. Shock absorbers are beneficial in reducing jarring. Before making your final choice, check the weight and grip of the handles to ensure the tool is comfortable to work with.

There are also electric models available which are faster, easier to use and often allow for greater accuracy. Before purchasing, check warranties, service back-up, availability of spare parts and instructions for use.

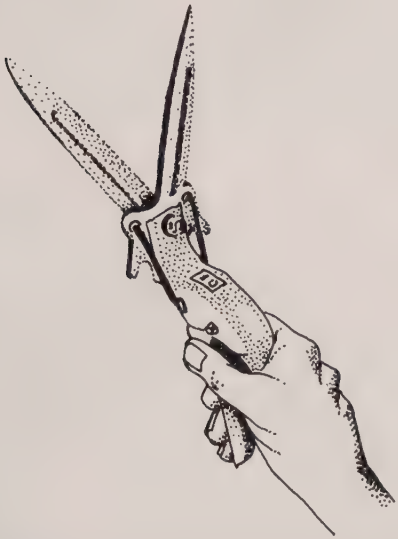


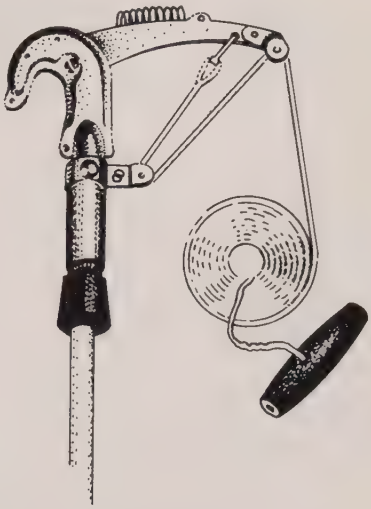
Lawn Trimmers
The simplest tool for trimming lawns is a small hand tool which cuts the grass in a scissor-like action. They require two hands to operate and are used working on bended knees. Long trimmers are used from a standing up position. These are generally heavier, enabling the cutting of thick spreading ground cover.

Cordless electric grass shears are also available with rechargeable batteries.

Extended Pruning Equipment
Extension pruners are used for light-weight summer pruning jobs beyond normal reach. Various lengths are available.

Extension loppers and saws are used on branches which are out of reach and up to 5cm thick. Tools are attached to the end of the extension pole and operated by pulleys and ropes. Poles are available which extend as far as two metres.





CARING FOR YOUR TOOLS

HAVING CAREFULLY selected the necessary tools for your garden, it is equally important to care for them properly, to ensure continued good performance and longer life. After use, scrape soil off them and wash and dry them. Any metal parts can be wiped with an oily rag to prevent rusting. Keep cutting edges sharp. Rubbing with a sandstone or oilstone maintains the edge without wearing the blade away. Joints should also be lightly oiled to keep them running smoothly. Keep shears at the right tension; if they are tearing your plants, they may need tightening.

Wooden handles can be varnished or occasionally oiled with linseed oil. This penetrates the timber making it more durable to stresses and strains and is easier on the hands, avoiding blisters and splinters.

All tools should be stored in a dry area.



CHAPTER FIVE

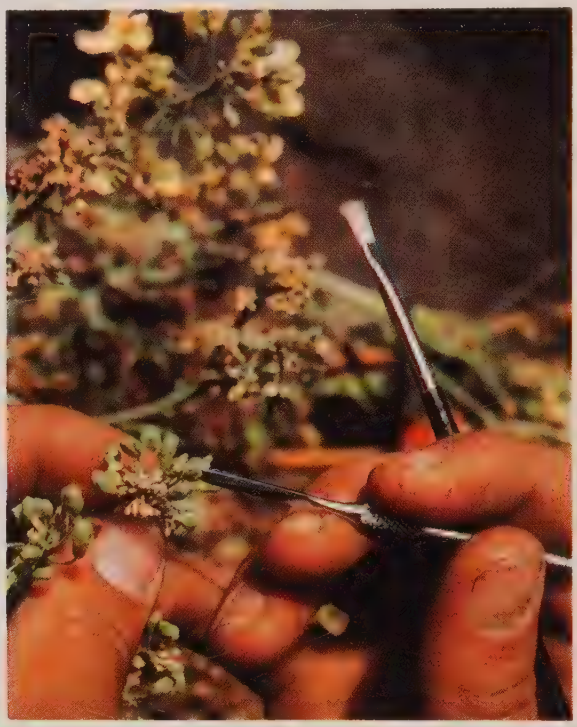
SEED

RAISING PLANTS from seed can be very rewarding. Watching a seed poke its first leaves through soil, grow and bloom is a thrilling and creative experience. In addition it is an inexpensive way to raise plants and it may be the only way to obtain plants early in the season or those that are rare and unusual. Often it is simply the easiest way of growing particular plants.


Star of the Veldt
Squash
Cornflower
Beetroot
Sunflower
Lupin
Marigold
Forget-me-Not
Zinnia
Cathedral Bells
Petunia
Sweetcorn
Scabiosa
Scarlet Runner Bean
Dwarf Bean
Dianthus
Strawflower
Watermelon
Parsnip
Silverbeet
Nasturtium

THE YATES SEED STORY

Yates have been major suppliers of seed in New Zealand and for export, for over a century. The production of commercial seed is a highly skilled and technical job: the processes include plant breeding, evaluation, seed production, seed testing, storage and quality control.



Bud pollination of brassica breeding lines.

PLANT BREEDING aims to produce plants superior in most aspects to existing plants. Objectives may include higher yields, improved flavour, colour or form, wider climatic performance and resistance to certain pests and diseases.

Yates' main research station is situated in Pukekohe. However, trials are carried out throughout New Zealand, as well as in Australia, Fiji and Papua New Guinea. Not only are New Zealand cultivars evaluated, but introduced plants are trialled under local conditions. Promising lines are tested by special growers for at least two years before being considered for commercial release.

Seed for sale is grown under contract by specialist growers who keep their crops isolated from similar plants to avoid contamination and variability in the seed progeny. Poor or inferior plants are rogued or removed while the crop is growing.

After harvesting the seed is cleaned, processed and conditioned to prolong its life. The most important factors for achieving this are reduced moisture and reduced temperature. The seed is stored in a special vault where the temperature and relative humidity are kept at 20°C and 20% respectively. These conditions slow down the metabolic and aging processes, enabling the seed to hold its vigour and germination for extended



Flowering onion plants in an isolation cage being mass pollinated by bees.



Seed germination cabinet, where light, temperature and moisture levels are controlled in order to test optimum germination levels for each plant species.



Onion trial at Pukekohe.



Paper roll germination test. The paper is moistened and seeds are spaced along one edge. It is then rolled and placed in a germination cabinet. After a specified time, which is different for each species, a count is made of the number of seeds germinated. This determines the ***germination percentage.***

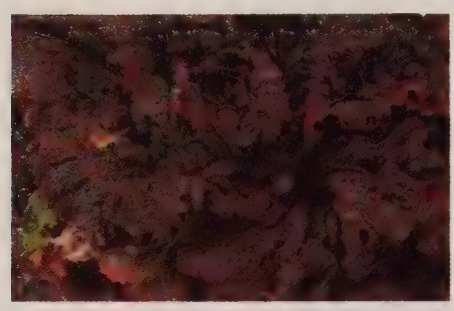
periods of time.The seed is packed into a foil sachet which excludes moisture and helps reduce temperature fluctuations. Normal aging recommences when the sachet is opened. Do not expose sachets to direct sunlight or other forms of excessive heat. (Peas, beans and sweet peas are not suited to conditioning in a seed vault nor are they put into foil sachets due to their naturally higher moisture content.)

At the time of packing, each packet of seed is stamped with an expiry date and a code number. This can be found on the top edge of the packet which should always be retained for reference. The expiry date refers to the shelf life of the packet. Experience has shown that the packet becomes discoloured and tatty after four years and the seed, although usually still viable, is removed from sale.

The code number refers to the particular batch or seed line of the species used. Every six months all Yates seed available for sale is germination tested. If the rate of a particular line drops below standard, it is also removed from sale.

YATES CULTIVARS

VEGETABLE AND flower seeds are exported by Yates to more than 60 countries including tropical and semitropical areas. The following are some exceptional cultivars that have been introduced from Yates research trials:



Red Sails is a novelty red loose-leaf lettuce of high nutritional value.



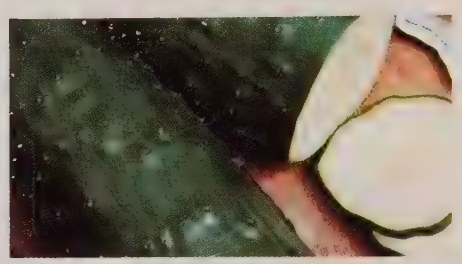
Red Alert is a compact bush tomato requiring no staking or training. It is high yielding and very sweet. Hybrid



Novella is a self-supporting pea which does not require staking, high yielding and very sweet.



Pot Luck is a compact, high yielding cucumber suited to growing in containers or small gardens. Hybrid.



Slicemaster is a high yielding, long, straight cucumber, quite resistant to diseases. Hybrid.



Dwarf Sugarsnap are peas plus pods, sweet and juicy. They do not require staking and are stringless.



Pukekohe Long Keeper is a most popular Long Keeper onion with firm pungent flesh which keeps up to ten months.



Summer Sweet is a super-sweet sweetcorn which retains its freshness up to 15 days after being harvested. It is so sweet it can be eaten raw. Hybrid.



Early Money is a high yielding, quite disease-resistant tomato which sets fruit under cool spring and autumn conditions. Hybrid.



Sweet 100 is a sweet, small fruiting tomato. Hybrid.



Sweet Butter is a quality butterhead lettuce, very sweet and tender, performing very well over a range of conditions and heat tolerant.



Snowflake is an edible-podded sugar or snow pea, whose pods remain flat.



Sugar Daddy is a dwarf sugarsnap pea where the peas plus pods are sweet and juicy. They do not require staking and are stringless.

A SEED consists of an embryo and its stored food supply surrounded by a protective seed covering. While it may look lifeless, it is important to remember that a seed is a living organism and respiring (breathing) at a slow rate. Like other living things, seeds will eventually die. They should be handled and stored with care to prolong their life. Always keep them in a cool dry place, preferably in sealed foil sachets.

REQUIREMENTS FOR GERMINATION

THE ABILITY of a seed to germinate is called 'viability'. The requirements for seed germination are viable seed, water, oxygen, the correct temperature and sometimes light.

The first step in the germination process is the absorption of water which causes the seed to swell and chemical reactions within the seed to speed up. Seeds are sometimes soaked before planting to initiate germination and shorten the time required for seedlings to emerge. This is particularly advantageous with seeds which have hard seed coats e.g. kowhai, sweet peas. Remember, however, that prolonged soaking can sometimes injure the seed.

With the increased chemical activity within the seed there is also an increased requirement for oxygen. In poorly drained seed beds where there is an excess of moisture, the seeds can suffocate from lack of oxygen.

Temperature is also important. Seeds of different species, depending on where they originate from, germinate at different temperatures. Seed can sometimes also respond to seasonal or day/night temperature fluctuations. Usually the colder the temperature, the slower the germination. At low temperatures germination may be slow and uneven, disease more prevalent and seedlings may be injured. It is common to have failure or poor spindly growth with first sowings of summer vegetables such as beans, tomatoes, sweet corn, pumpkins, melons etc. which are sown before soil temperatures are warm enough.

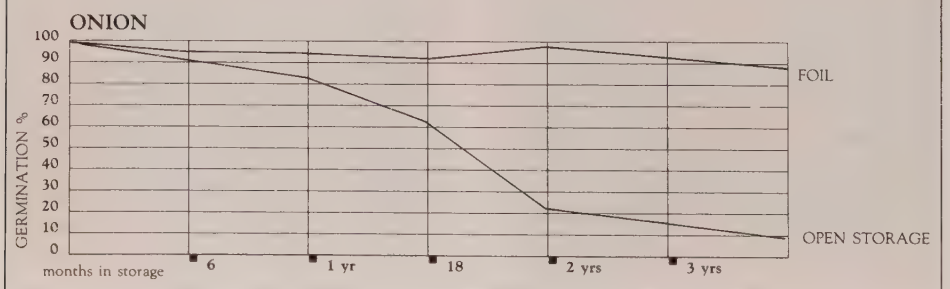
Some seeds, especially when freshly harvested, may require a period of cold temperature (to simulate a winter in nature) before germinating (e.g. peach, NZ spinach, gingko). This dormancy is broken by pre-chilling or stratification and involves exposing the seeds to temperatures of 5°C or less for four days and keeping the seeds moist. This can be done simply by sowing the seeds in a container, sealing it in a plastic bag and placing it in the refrigerator.

Apart from the influence of temperature, some seeds germinate faster than others. It is important to know when to expect seedlings to show. The optimum temperature for germination and the time expected for common vegetable and flower seedlings to appear is given in the chapters on flowers and vegetables.

Light can also stimulate or inhibit the germination of some seed. Fortunately, most vegetable and annual flower seeds

GERMINATION COMPARISON

Comparison germination test between seed stored in foil and seeds stored in open storage



do not have complex germination procedures and their cultivation is quite straightforward.

Sometimes it is advantageous to treat seeds, particularly peas and beans, with a fungicide dust before sowing, to protect the seed from fungous diseases in the soil. Copper oxychloride or other fungicide powder can be used. Add a small quantity of fungicide to the packet (sufficient to lightly coat the seed) and shake well.

RAISING SEED

THERE ARE various methods of raising plants from seed whether in the open ground or in containers.

Seeds in the Open Ground

Many seeds can be sown direct into the open ground. This is a good way to avoid double-handling the plants and eliminates transplanting shock, which causes a temporary setback in growth by disturbing the root system at transplanting. However, seed in the open ground is more susceptible to environmental conditions which may affect the percentage of germination. Some plants, particularly root crops, do not transplant well and must be sown in their permanent position in the garden, e.g. carrots, parsnips.

RAISING SEED IN CONTAINERS

MANY PLANTS will get a better start if sown in containers and later transplanted. It is easier to control environmental conditions – temperature, light, moisture and the growing medium which result in a higher rate of germination. By raising indoors the growing season can also be extended.

The best media for germinating seeds are sterile mixtures of peat, sphagnum moss, fine bark, sand or pumice. Black

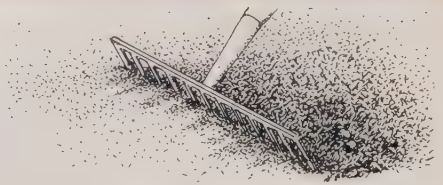
When sowing seed direct, prepare the seedbed with care. This can be done a week or two before sowing to stimulate the germination of weed seeds which can then be removed before sowing the crop. It is important that the germinating seed has as little competition from weeds as possible.

Cultivate the area with a fork or spade, working in compost and/or peat and Gro-Plus General Garden fertiliser. Cultivate fertiliser thoroughly through soil, to avoid any risk of burning seed or young seedlings. Rake smooth and water. For a more economical use of fertiliser, place in a band to the side or below the seed. Open a furrow 15–20cm deep, scatter fertiliser along the bottom and mix with soil. Cover with soil, make a shallow furrow for seeds on top of the fertiliser or to one side.

SEEDS in the open ground



1 DIG OR fork over soil, incorporating compost, peat and fertiliser



2 LEVEL and smooth to a fine tilth by raking



3 MAKE a shallow furrow or drill, and water



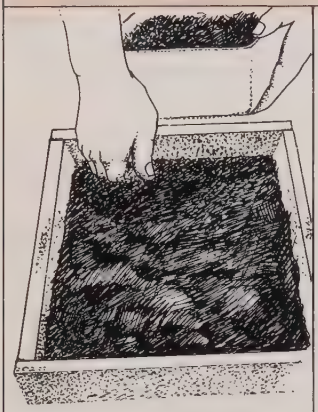
4 SOW seed thinly at recommended spacing. Cover with fine soil or seed raising mix. Firm soil with rake head

Magic seed raising mix, for example, provides a fibrous, spongy, clean medium of peat, pumice, sphagnum moss and a fertiliser base to germinate seeds in. It has a high water holding capacity and is also well aerated. The sphagnum moss has special properties which help inhibit 'damping off' diseases of seedlings. Soil from the garden should not be used to germinate seeds in containers. It is likely to contain disease organisms and weed seeds and to be highly variable. It will not in most cases be the right texture and will compact easily, impeding drainage and aeration.

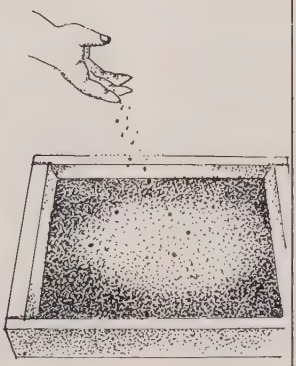
There are a multitude of containers which can be used for sowing seed. All that is required is something to hold the growing medium and allow adequate drainage to prevent water logging.

Seeds raised indoors are normally sown in a small container first. The seedlings, when large enough to be handled, are then transplanted or 'pricked out' into a larger container before finally being transplanted outside.

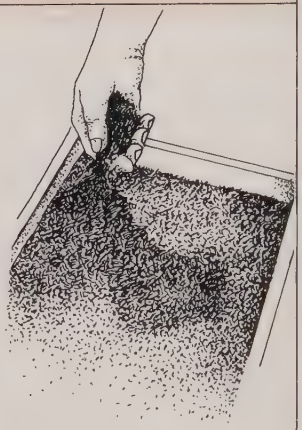
SOWING SEED IN CONTAINERS



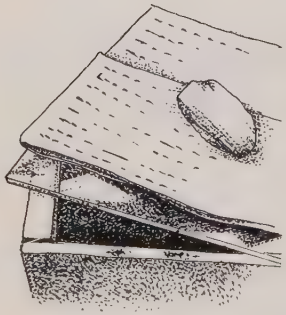
1 *FILL THE container with seed raising mix to 1 cm below the top of the container. Level and firm down.*



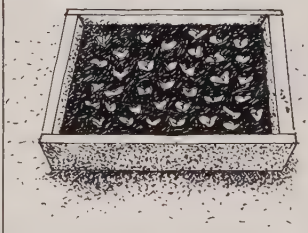
2 *SOW SEED by lightly scattering over the surface.*



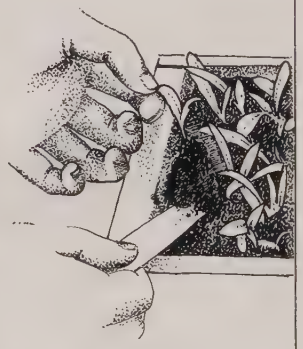
3 *LIGHTLY COVER seed with seed raising mix, press gently into surface.*



4 *COVER WITH glass and paper to maintain an even moisture and temperature.*



5 *PLACE IN a warm sunny position in winter and early spring, or a shady position in summer. When germination is complete remove cover to allow ventilation.*



6 *WHEN SEEDLINGS get their first true leaves (the leaves which appear after the two seed leaves), they are ready to be 'pricked out'.*

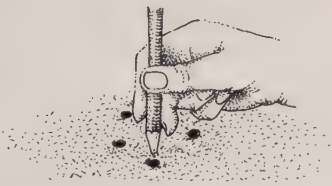
PRICKING OUT



1 FILL A small container with potting mix.



2 LOOSEN SOIL around the seedlings and carefully lift, handling them by their leaves. Gently tease individual plants apart from the tangled mass of roots.

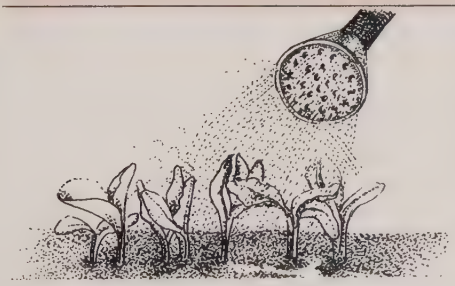


3 MAKE A hole with an old pen or pencil (often called a 'dibble') in the new container.



4 PLACE THE seedling in the hole, firm the mix around it, and water. Keep the transplants out of direct sunlight for several days to adjust to change. In three to four weeks the seedlings will be ready to plant in the garden.

TRANSPLANTING



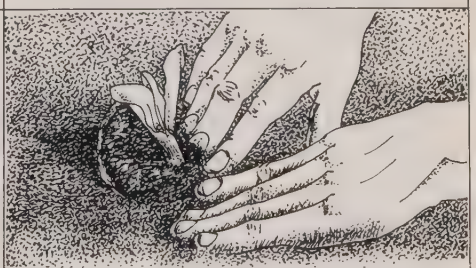
1 WATER seedlings well



2 DIG a hole slightly larger than root-base of seed



3 PRISE seedlings apart, or tip out of pot or plug



4 PLACE seedlings or peat pot in hole and carefully fill in soil around roots. Firm soil down, water

Seed-raising Kits

Seed-raising kits contain all the necessary items to make seed germination easier and successful. The kits contain seed, seed-raising mix, a tray, growing compartments and a propagation cover which ensure even temperature levels and provide an ideal microclimate for germination. The kits are neat, tidy and compact and are easily moved from one place to another around the house. For the novice or for an early start in the season, when seed raising is difficult, seed-raising kits are ideal.





Peat Pots

Using peat pots is the easiest method of raising seed indoors and cuts down the number of steps involved. Peat pots are made of peat which breaks down easily

CHECKLIST TO GERMINATION TROUBLES	
Too Wet	Seed needs to be damp, not wet, for germination. Excess water prevents oxygen getting to the seed. Poorly drained soils may also have a high incidence of soil fungus diseases. The condition of wet soils can be improved with the addition of peat and compost and by raising the beds above the surrounding levels. To improve the germination of seeds, sow them in a band of seed raising mix.
Too Dry	A certain amount of water is essential for germination, so maintaining constant moisture during the germination period is vital. Cover containers with glass or paper to prevent drying.
Too Cold	Cold temperatures result in slow, uneven germination; disease becomes prevalent and seedlings may be injured. Each species has a different optimum temperature for germination. Do not sow summer plants too early, e.g. beans, tomatoes, sweet corn, pumpkins, melons, cucumbers, petunia, portulaca and zinnia.
Too Hot	High temperatures result in excessive drying and injury to seedlings.
Planting Too Deep	This will result in delayed emergence. Seeds may not be able to grow sufficiently to reach the surface on the limited food reserve within the seed. Soil temperature is also lower with depth. As a guide, sow seed to a depth equal to twice the thickness of the seed. Very fine flower seed, e.g. begonia, petunia, is best just pressed into the surface. In dry weather, seed can be planted a little deeper as the surface may dry out.
Planting Seeds too Shallow	This could cause them to dry out.
Seed Beds Too Loose	This results in too much air surrounding the seeds: they will not absorb moisture, and are likely to dry out.

over time. One seed can be sown in each pot and when the seedling is large enough the whole pot can be transplanted which eliminates root disturbance and transplanting shock. The pot should be wet at transplanting and kept wet until roots have established themselves in the surrounding soil.

There are two types of peat pots: a pot which has to be filled with potting mix; and a peat pellet which is made of compressed peat and expands with the addition of water.

Transplanting

Seedlings raised indoors should be gradually exposed to the lower temperatures outside before transplanting. Seedlings should be placed outside during the day and brought inside at night. After a week or two of conditioning or 'hardening' seedlings to colder temperatures and more sunlight, they will be ready to transplant in the garden.

Seedlings should be transplanted in the garden soil with minimum root disturbance.

Dig a hole slightly larger than the root ball of seedling, and water. For seedlings raised in containers carefully prise the individual seedlings apart, place seedling in the hole and fill soil around the roots carefully. Firm the soil down, and water.

For seedlings grown in individual plastic pots or plugs, tip the pot up and tap the plant into the hand, pushing the bottom of the pot.

Seedlings raised in peat pots can be planted so the top of the peat pot is flush with the soil.

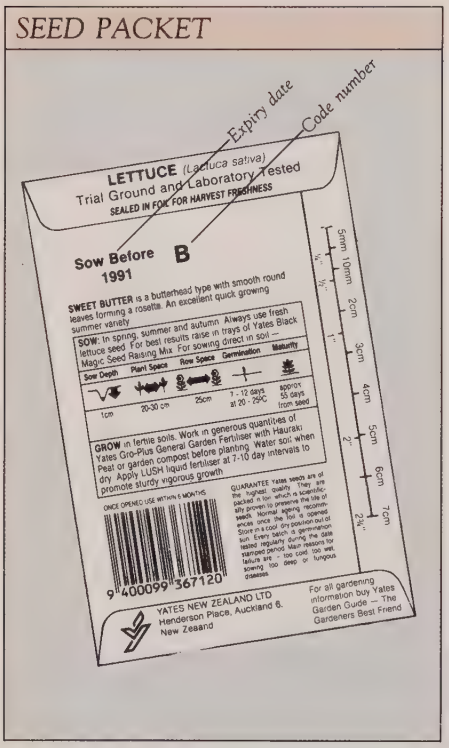
Pay special attention to seedlings over the first few days and make sure they have adequate water. Do not wait for them to wilt! If necessary shade from intense heat in the middle of the day and protect from strong winds until well established.

It is best to transplant seedlings in late

CHECKLIST TO GERMINATION TROUBLES	
Seed Beds Too Firm	This prevents oxygen getting to the seed. Drainage is also impeded.
Presence of Soil Fungus Diseases	Seeds may rot or seedlings topple. Overwatering, poor drainage and lack of ventilation will increase the incidence. Sow seeds in sterilised seed-raising mix and ensure containers are clean. Plan a rotation of crops to prevent the build up of soil diseases (leaf crops followed by root crops etc.). Sterilising the soil with Basamid granules will clean up badly diseased soil and should be used in small gardens where crop rotation is difficult.
Slugs and Snails	During late autumn, winter and spring, slugs and snails may destroy seedlings as soon as they appear. Bait areas with Blitzem every 2–3 days or with Mesurol every 2–3 weeks.
Birds, Cats, Dogs, Insects	These are often responsible for destroying seed and seedlings. Cover seed beds with a fine-meshed netting. Seeds can be damaged or eaten by insects, e.g. springtails, earwigs. Prevent by sowing seed with Diazinon granules.
Fertiliser Burn	Seed in direct contact with fertiliser can be burnt. Fertiliser should be worked into soil several weeks before sowing seed, or placed in a band below or beside the seed. Seedlings in the presence of high soluble salts are also more prone to 'damping off' diseases.
Seed Viability and Storage	Always use fresh seed. Some seeds such as parsnip and lettuce have a short life once the foil packet is opened. Seed deteriorates quickly if stored in a damp place, or exposed to high temperatures. Always treat and handle seed with care to prolong its life. As a general guide, once the foil sachet has been opened the seed should be used within six months.

afternoon or evening under cool conditions. Protect from snails and slugs by laying Blitzem or Mesurol snail and slug pellets.

SEED PACKET



HYBRID SEED

HYBRID SEEDS have become very prominent in horticulture and will become increasingly important in the home garden.

Hybrids are produced by breeding from two selected parents with special qualities, e.g. one parent may crop heavily and the other mature early, resulting in a hybrid which produces high yields early in the season.

The production of hybrid seed is difficult and time consuming and as a result the seed is more expensive. However, hybrids offer a number of important advantages over open pollinated varieties which outweigh the extra cost of the seed.

They give a quicker and more even germination, the plants are vigorous and produce higher yields, they have a higher natural resistance to pest and diseases, and are genetically uniform.

It is not possible to save the seed from hybrids for resowing. Some hybrids are sterile and do not produce viable seed. Other hybrid seed will degenerate and produce highly variable off types in succeeding generations. To ensure quality and maintenance of the hybrid, the cross should be made each year.

SEED GERMINATION



CHAPTER SIX

VEGETATIVE PROPAGATION

PLANT PROPAGATION is the creation of new plants from old.

Sexual propagation occurs when male and female parts of the plant unite to produce seed. Because there are two parents variations will always occur among seedlings.

Asexual propagation, or vegetative propagation, occurs when a piece of a plant is cultivated and grown. In this case the resulting plant is identical to the original one. Vegetative propagation is a very important part of horticulture and is often the only way to maintain a particular cultivar, e.g. Peace roses and Splendour apples.

SOME CULTIVARS do not produce viable seed and must be propagated asexually, e.g. bananas and oranges. Vegetative propagation may also be easier and quicker than growing plants from seed: for example, the seed of the cotoneaster has a complex dormancy condition, but cuttings taken from the stem of the plant will root rapidly. Other plants have a long juvenile stage where no flowers and fruit are produced. Vegetative propagation can reduce this time by several years with plants such as kowhai, and avocado.

There are a number of techniques for propagating plants vegetatively.

DIVISION

WITH CLUMPING perennials, bulbs or plants with rhizomes or tubers it becomes necessary to divide the plants up to keep them healthy and vigorous. Each rooted segment or division is capable of becoming a new plant. By dividing an overgrown clump into separate parts, it is possible to get many new plants. The following plants are commonly divided: perennial asters, aubretia, canna, chrysanthemum, dahlias, delphiniums, dianthus, phlox, polyanthus, sedum, agapanthus, kniphofia, flaxes and african violets.

Tuber division works for the large tubers of begonia, caladium and callas. Simply cut the tuber into pieces, making sure that each part has a bud or eye. Dust the cut surface with fungicide and plant in a moist soil.

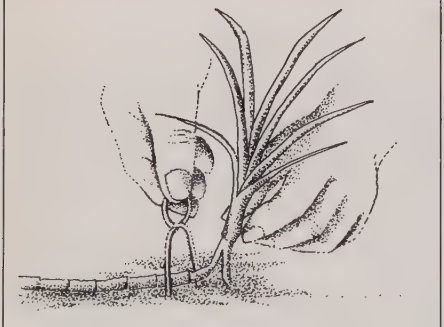
Several common plants reproduce by sending out miniature new plants on runners or new shoots. Some examples are spider plants, strawberries, and sempervivum. These offshoots can be cut off and planted.

LAYERING

LAYERING IS the development of roots on a stem while it is still attached to the parent plant. If the stems of certain plants lie along the surface of the soil, they form roots where the stem touches the ground. A branch can be pegged down into the soil to encourage roots to form. Usually a cut is made on the under surface to encourage root formation and when roots develop the section is separated from the parent plant.

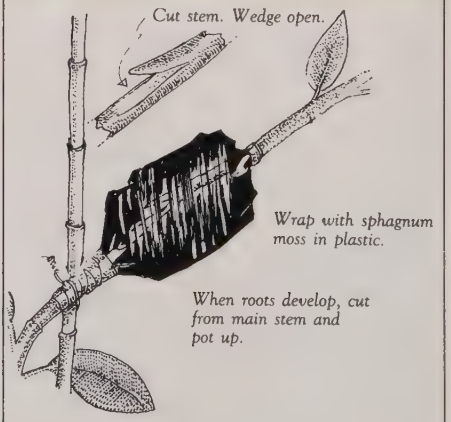
A similar technique called air layering is especially useful with some of the larger house plants such as rubber plants, magnolias, camellias and azaleas where the branches are higher up on the plant, and cannot be bent down to soil level. A small cut is made in the shoot just below a bud and this area is then wrapped in a black plastic bag containing

LAYERING Carnation stem



Cut stem and peg down.

AERIAL LAYERING

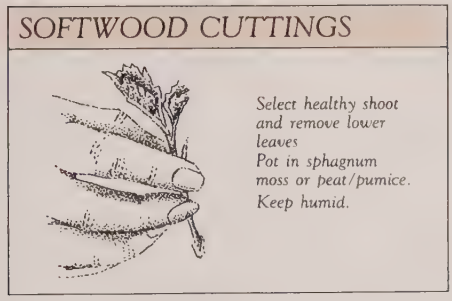


a growing mix or sphagnum moss. Over a period of time roots develop from the cut and this section can then be removed from the plant.

STEM CUTTINGS

STEM CUTTINGS are the most popular method of vegetative propagation. Different types of wood can be selected for cuttings, but always make sure they come from a healthy vigorous plant.

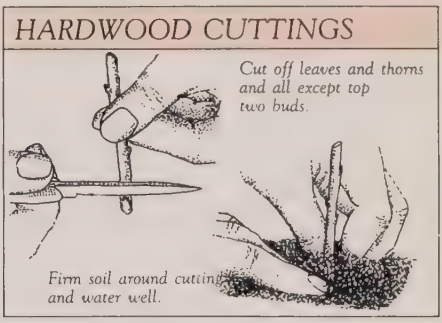
Soft Wood Cuttings
Soft wood cuttings are taken from the young tips of shoots whose stems are still soft. A shoot between 5cm to 10cm long is cut off the parent and the lower leaves removed. When cuttings have very large leaves it may also be necessary to remove some of the leaves to reduce the area over which water can be lost. The cut end of the cutting should be dipped in a hormone rooting powder before it is inserted into a pot of sphagnum moss or pumice/peat mix. The cutting must be kept humid, which is easily done by placing a clear plastic bag over the pot, keeping the air moist inside. Chrysanthemums, Coleus and Begonias are commonly propagated by softwood cuttings.



Semi-Hard Wood Cuttings
Semi-hard wood cuttings are taken from wood of the current season's growth, usually in summer or autumn just as the soft spring growth has started to become woody. Plants commonly propagated by semi-hard wood cuttings are camellia, pohutukawa and hebes.

Hard Wood Cuttings
Hard wood cuttings are taken from one-year-old wood on deciduous woody plants and evergreens. The length of the pieces of stem varies depends on the plant that is used – anything from 5cm to 3 metres. A hard wood rooting hormone can be used. Deciduous hard wood cuttings do not need to be kept in humid conditions because they have no leaves. They can be placed straight in the ground, e.g. willow, grapes and roses. Evergreen hard wood cuttings are more difficult to root and often need to be placed in a propagating bench where bottom heat helps stimulate root development.

Evergreen hard wood cuttings are pulled off the parent plant so that a heel (strip of wood) is left on the bottom of the cutting. This exposes the cambium layer where the roots develop. Evergreen cuttings are taken in autumn or winter and can take up to a year to develop roots.



LEAF CUTTINGS

SOME PLANTS have the ability to propagate themselves from a single leaf cutting, e.g. african violet, rex begonias, kalanchoe, cedum, pepperonias. Plants with long-stemmed leaves such as african violets can develop roots on the stalk. The leaf is removed from the plant and inserted in the growing medium up to the base of the leaf, which must be kept watered.

Other plants can be propagated by cutting through the veins on the underside of the leaf then laying the leaf flat on the surface of the growing medium, so that tiny roots and small buds develop with the cuts. This method can be used on begonia rex and streptocarpus.

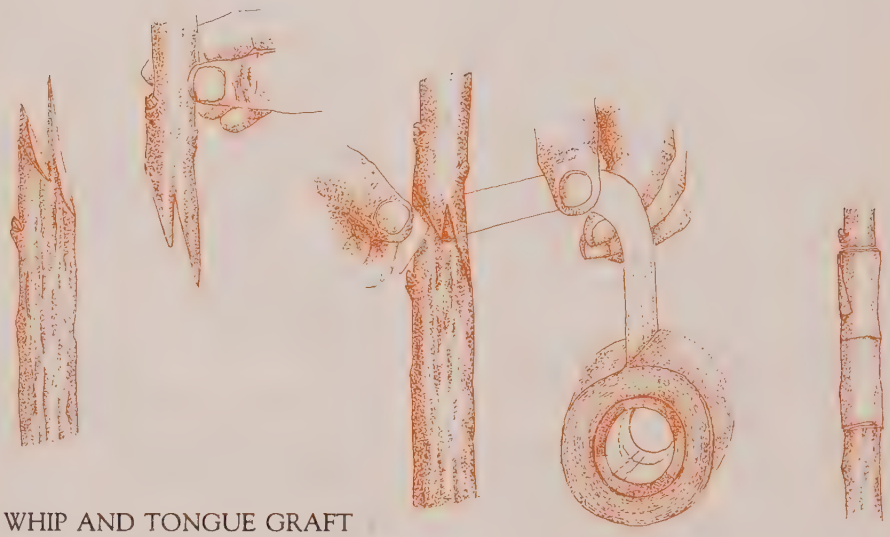
ROOT CUTTINGS

ROOT CUTTINGS are not common but may be used for lilac and robinia. The cuttings are taken from the roots of the parent plant in spring and autumn and are placed horizontally below the surface.

BUDDING AND GRAFTING

THIS INVOLVES taking a bud or a shoot from one plant and growing it on the roots of another closely related plant. The plant providing the root system is called a *root stock*, while the piece that is grafted on is called the *scion*. This is a good way of propagating plants which are difficult to produce by other methods. The root stock has considerable effect on the performance of the resulting plant. It may be resistant to pest and diseases or may affect the size of the tree e.g. dwarfing root stocks and vigorous root stocks.

METHODS OF GRAFTING



WHIP AND TONGUE GRAFT

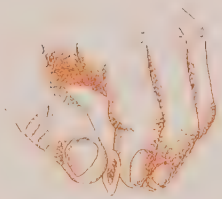
This method is used when a scion and the stock are of the same diameter and up to 2.5 cm thick. A slanting cut is first made at the base of the scion. A sloping cut the same size as that of the scion is made into the stock, then another cut is made into the surface, forming a tongue to take the scion. Stems are then slotted together and bound up with grafting or insulating tape to make the graft firm, or airtight.

Root stocks can also be used to improve the flavour or skin thickness of fruit. Sometimes several varieties can be grafted onto one root stock. This can be very convenient in small gardens where one apple tree, for instance, can have two or three varieties grafted onto it.

TISSUE CULTURE

PLANT TISSUE culture is essentially a laboratory technique. The growing tissue at the centre of a shoot is removed and placed in a flask in a nutrient medium. When large enough the plantlets are transplanted. The advantage of this form of micro-propagation is the very rapid multiplication of plants and their relative freedom from virus diseases. Orchids, carnations, african violets, calla lilies, azaleas, ferns, grapes and tobacco are commonly regenerated in this manner on a commercial basis.











BUDDING

Budding is for smaller pieces of scion material and is used for roses, apples and plums as well as other ornamental trees and shrubs. A bud with a piece of bark attached to it is removed from the shoots of the current season's growth. A 'T' shaped cut is made in the bark of the stock and the bark lifted, the bud is pushed into the bark and trimmed to fit. The bud and the stock are firmly tied together with tape leaving the bud uncovered. Eventually the bud will grow into a shoot and when the tape is removed the top of the stock plant can be cut off.

CROWN OR CLEFT GRAFTING

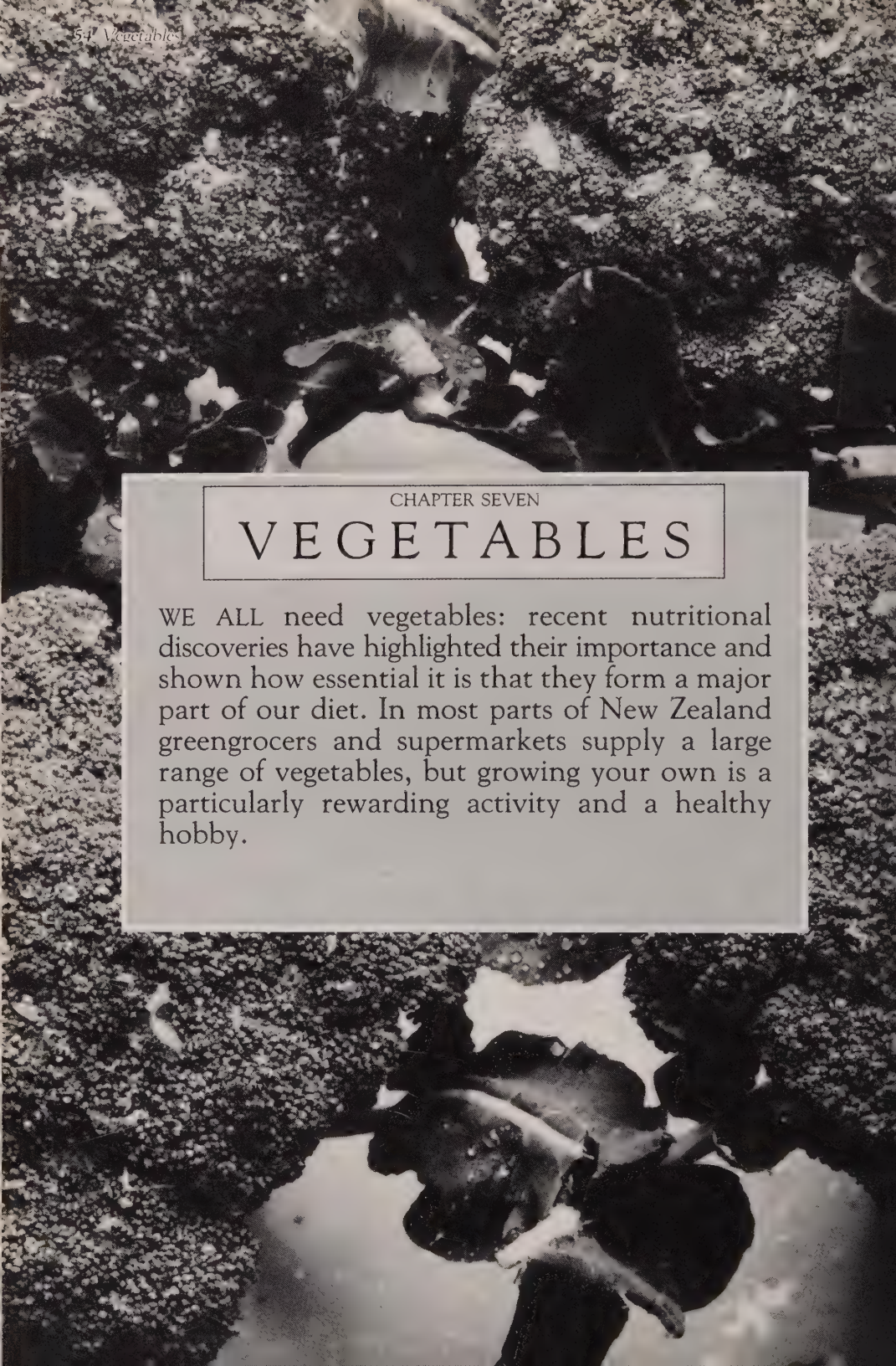
Crown grafting is often used on old fruit trees. The top of the stock is cut off and a cut made into the bark of the exposed wood. The scion is cut into a wedge shape at its base to the same length as the cut on the root stock. The scion is then inserted into the cut on the stock so that the cut surfaces touch. The stock and scion are held together with tape.











CHAPTER SEVEN

VEGETABLES

WE ALL need vegetables: recent nutritional discoveries have highlighted their importance and shown how essential it is that they form a major part of our diet. In most parts of New Zealand greengrocers and supermarkets supply a large range of vegetables, but growing your own is a particularly rewarding activity and a healthy hobby.

VEGETABLES CAN be harvested at the peak of freshness, tenderness and flavour and you can grow a wider choice of varieties than are available through markets. With a little cunning vegetables can be produced out of season when they are not in the shops, or are very expensive. Growing your own vegetables also allows control over the selection and use of garden sprays. When buying we usually demand quality vegetables free from blemishes but we know nothing of the types of sprays and spray programmes which have been applied to prevent pest and disease damage.

Growing vegetables has never been easier: the newer varieties, particularly hybrids, are very high yielding and have better resistance to pests and diseases. Today's vegetables are often bigger, better flavoured, more colourful and grow over a wider range of climatic conditions. The new bush or dwarf varieties (e.g. Red Alert tomatoes, Buttercup Bush pumpkin, Potluck cucumber) take less space in the garden and are suited to growing in tubs or large pots on a sunny balcony or patio.

THE SITE

VEGETABLES SHOULD be grown in a site open to the sun. Most need as much sunlight as possible, especially in winter when the days are shorter. Avoid shade from buildings, fences, trees and shrubs. Trees with root systems reaching into the vegetable garden will compete for soil moisture and nutrients and should also be avoided. Protection from wind is important. Cold winds slow down growth. Hot, dry winds evaporate large amounts of water from soil and plants. Strong winds will physically damage plants.



Allow sufficient sunlight and shelter when planning the vegetable garden

THE SOIL

IDEALLY THE soil has a loose crumbly structure which is capable of absorbing and holding water and nutrients but is also well aerated and drains easily. Incorporate as much organic matter (compost, peat etc.) as possible on a regular basis (refer to the chapter on soils and water).

Apply Gro-Plus General Garden fertiliser 200g (4 handfuls) per square metre, as a base dressing before planting. Most fruit- and seed-producing vegetables benefit from a side dressing of fertiliser when flowering commences. Leaf vegetables will benefit from liquid feeding with Lush every 2–3 weeks. In high rainfall areas lime at the rate of 250g per square metre can be applied annually. Take care not to add too much lime (refer to the chapter on fertilisers).

SUCCESSIVE SOWINGS

A MAJOR key to success in the vegetable garden is to achieve a continuous harvest of vegetables. Unfortunately more commonly everything ripens at once. To avoid this frustrating problem and to make best use of the garden space, planning is necessary. Small successive plantings of vegetables at 3–4 weekly intervals will spread the harvest time. Always have an empty bed or section in preparation for the next planting.

CROP ROTATION

CROP ROTATION helps prevent the spread of soil-borne pests and diseases which may attack vegetables belonging to the same group or family. Disease build-up can be avoided by rotating crops around the garden so that the same or similar crops are not grown in the same area successively. Soil should always be replenished with plenty of organic matter and fertiliser. In small gardens where space is limited and crops cannot be grown in a different bed, the soil can be sterilised with Basamid.

Broccoli, Brussels sprouts and cabbage should be rotated so they are not grown in the same area more than 1 year in 3, to avoid clubroot. Where applicable, rotation times are given in the notes on individual vegetables.

PATTERN

A simple crop rotation routine is outlined below, for a vegetable plot divided into three strips.

Root crops include: beetroot, carrot, parsnip, potato, salsify.

Brassica crops include: broccoli, Brussels sprouts, cabbage, cauliflower, kohl rabi, radish, swede, turnip.

Other crops include: eggplant, bean, pepper, celery, cucumber, endive, leek, lettuce marrow, onion, pea, spinach, sweetcorn, tomato.

YEAR 1	YEAR 2	YEAR 3	YEAR 4
ROOTS	OTHERS	BRASSICAS	SAME AS YEAR ONE
BRASSICAS	ROOTS	OTHERS	
OTHERS	BRASSICAS	ROOTS	

EARLY VEGETABLES IN THE

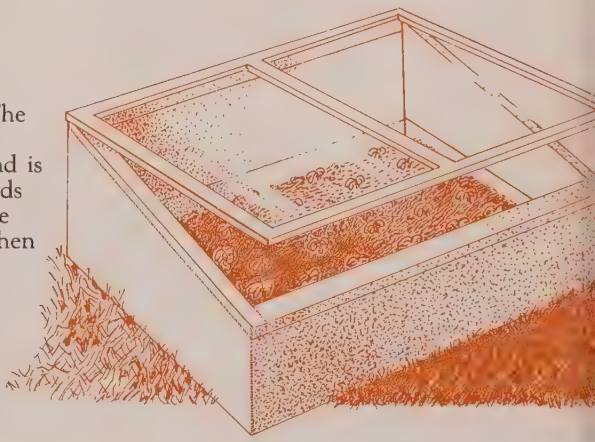
One of the greatest joys in home vegetable gardening is being able to produce summer vegetables early in the season. The first taste of a home-grown vegetable in early summer is an exciting moment; there is added joy and pride if the prices are still high in the shops!

The most critical factor in raising early vegetables is temperature. Anything which helps warm the soil or protect the plants from cold will be beneficial. When selecting a site for a vegetable garden, if you have any choice, a north-facing slope is best. A slope receives more sun than level ground and warms more quickly extending the growing season.

Mulches or ground coverings of various kinds prevent heat loss from the soil, encouraging early growth. Compost, peat and black polythene are commonly used. Mulches also have the advantage of conserving moisture and inhibiting weed growth. Various structures are used to influence temperatures.

COLD FRAMES

These are low, enclosed beds covered with glass or plastic. The warmth from the sun passes through the transparent top and is absorbed by the soil. Heat builds up in the cold frame during the day, warming the soil, which then releases heat gradually at night keeping the plants warm.



HOT CAPS

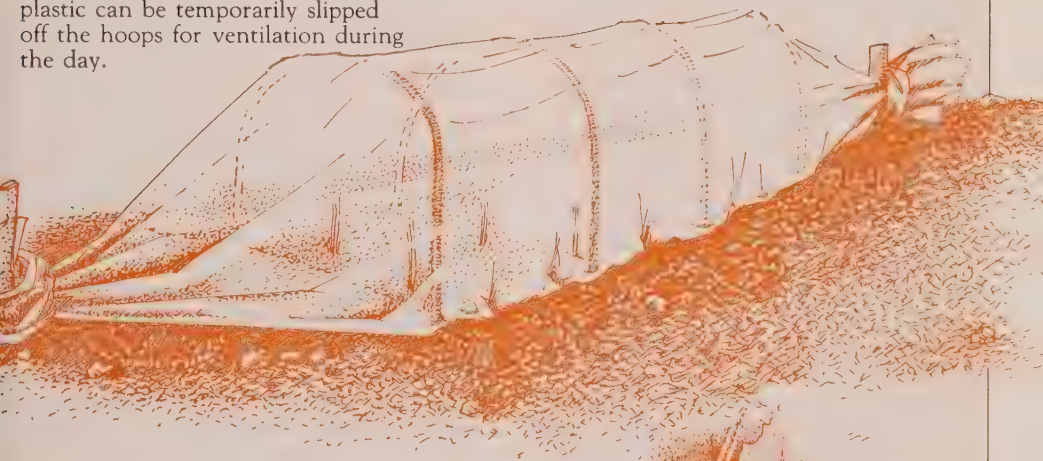
These are another simple method of providing a protected environment. They consist of a cone of translucent paper or plastic which is placed over individual plants when they are sown or transplanted. They are usually used for tender crops like cucumbers, melons and courgettes.



HOME GARDEN

CLOCHES

These are slightly more sophisticated and are tunnels made from sheets of plastic laid over wire hoops. The edge of the plastic is buried in the soil. The higher temperatures within the tunnel encourage early production. As the temperatures warm in summer the plastic can be temporarily slipped off the hoops for ventilation during the day.



CHOICE OF VARIETIES

One of the most critical factors in early vegetable production is the selection of suitable varieties. Early varieties set fruit under lower temperatures, are more tolerant to a range of conditions than main crop varieties and mature in a shorter number of days. Some suitable varieties for early vegetable production include: Pot Luck cucumber, Early Wonder beetroot, Early Money and Red Alert tomato, Sugar Baby watermelon, Marcross Express sweetcorn, Red Sails and Sweet Butter lettuce, Mini cauliflower, Little Finger carrots.



THE WINTER VEGETABLE GARDEN

THE WINTER vegetable garden is in many ways easier to manage than spring or summer gardens because pests and diseases are less prevalent. During winter, however, the soil can become very soggy, affecting plant growth. An over-wet soil is very cold and slows growth. Make sure your soil is free-draining. Heavy, clay soils which do not drain freely should be raised about 15cm above the surrounding areas by adding compost and/or peat. Raised beds drain freely and warm more quickly.

Good planning for a winter vegetable garden is important. Plan sowing and planting in early autumn so that the plants are at least half grown, or approaching maturity, for winter. The most difficult months to provide for are September and October as winter vegetables do not hold very long then and it is too early for many spring vegetables.

In warm areas, such as Auckland, the following sowing and planting dates can be used as a guide.
Make two or three successive sowings or plantings three to four weeks apart to give a continuity of supply. Always use fresh seed, and do not plant too deep. Remember to lay baits for slugs and snails.

Provided drainage is good, soil diseases should be at a minimum. Aphids are the major winter pests and are commonly found on cabbage, cauliflower, broccoli and Brussels sprouts. Maldison or Orthene give good control. The same group of vegetables also suffer from bacterial spots in wet weather and these are controlled with Copper Oxychloride. Rust, which is a problem with silverbeet, and chocolate spot or blight of broad beans, are also controlled with Copper Oxychloride.

SEED RAISING

MOST VEGETABLES are raised from seed. Large-seeded plants such as beans or peas are best sown direct in the place they are to grow. Root crops which cannot be transplanted (e.g. carrots, parsnips and radishes) must also be sown direct in the soil. All other vegetables can be sown direct but are in fact best raised in seed trays and later transplanted out in the garden, allowing for more control over conditions for seed germination, and better results. Plants can be raised ahead so that they are ready to plant out when

WINTER VEGETABLES			
Vegetable	Suggested Variety	Sow Seeds	Transplant
Broccoli	Triumvirates Mix	January/February	February/March
Cabbage	Green Gold	January/February/ March	March/April/May
Cauliflower	Mini Phenomenal 4-month	January/February/ March	March/April/May
Carrots	Manchester Table Topweight	February/March/ April	
Lettuce	Triumph	February/March	March/April
Leeks	Musselburgh	January/February	March/April
Parsnips	Freshman	February/March	
Silverbeet	Master Dark Green	February/March/ April	March/April/May
Spinach	Red Stemmed	February/March/ April	March/April/May
Broad Beans	Evergreen	April/May/June	

the preceding crop is finished, saving 6 to 8 weeks and making better use of available space. This also allows for an early start to the season when garden soil temperatures in early spring may still be too cold for good germination (refer to the chapter on seed).

When buying vegetable plants it is preferable to select small, healthy plants, rather than large ones which are more likely to be root bound and which will suffer a greater transplanting shock.

VEGETABLE VARIETIES

DESCRIPTIONS HAVE been compiled from trial reports and personal observations of Yates technical staff and are based on New Zealand conditions. However, the performance of any variety will differ depending on soil types, fertility, moisture, temperature and light intensity encountered during the growing period.



Artichoke (Globe)
Sow: spring
Sow at depth: 1–2cm
Plant space: 60cm
Row space: 1m
Germination: 12–15 days at 15–28°C
Maturity: 2–5 months

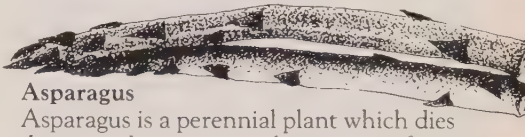
The globe artichoke is a grey-green thistle-like plant which grows to 1 metre and lasts 2–5 years. It is grown for the tender tasty bud scales on the immature flower head. Best suited to a climate with mild winter and cool summer.

Sow seeds in spring, or raise from shoots or suckers in late winter, the latter being easier.

The globe-shaped buds appear in early spring through to summer. Harvest when 5–10cm in diameter. After flowering keep plants well watered. In autumn cut back plants to 30cm high, leaving 4–5 shoots, and apply Gro-Plus General Garden fertiliser.



Artichoke (Jerusalem)
This is a large, sunflower-type plant with tuberous roots. Plant tubers in late winter, 10–15cm deep and 50–60cm apart. Tubers are ready 4–6 weeks after yellow flowers appear. They can be left in the ground until winter if necessary.



Asparagus
Asparagus is a perennial plant which dies down each winter and resprouts from below the ground in spring. The newly emerging spears or young unopened fronds are cut for use. Asparagus is easy to grow and once established is long-lived (8–20 years). It is best suited to mild or cold climates and a light soil which the spears can easily push through.

Asparagus can be grown from seed or crowns. Seed is sown in spring. Seedlings must be two years old before planting out in permanent positions. Alternatively and more commonly 2-year-old crowns (available from garden centres) are planted during the winter. Mary Washington is the standard variety.

Set crowns in a trench 15–20cm deep and 30–50cm apart. Cover with 5cm of soil, filling in the remainder as the plant grows. Water regularly in the summer. In autumn cut the yellow dry ferny foliage to ground level. Rake it up for burning. Do not cut spears in the first spring after planting. In the third year cut spears for 2–3 weeks then leave later developing spears to mature allowing the root system to replenish food reserves for the following seasons. Plants reach full maturity in 4–5 years at which time spears can be cut for up to 8 weeks before allowing spears to mature. Asparagus beds should be kept weeded. An annual application of 200g (4 handfuls) per square metre of Gro-Plus General Garden fertiliser should be applied in early spring. Asparagus is relatively free of pests and diseases.

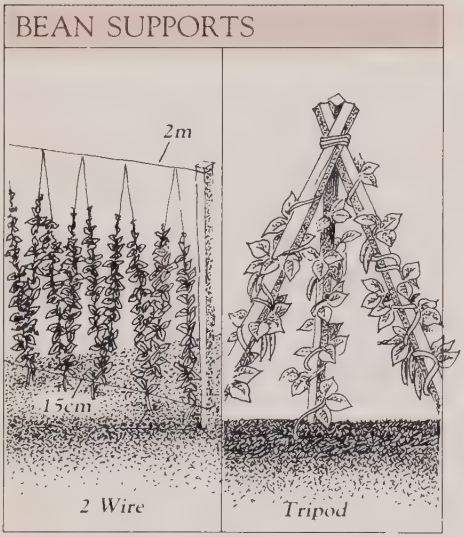
Aubergine
See Eggplant



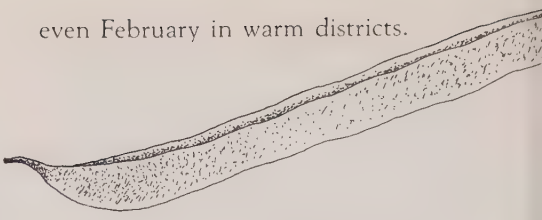
Beans
Sow: spring and summer

Sow at depth: 3cm
Plant space: 10cm
Row space: 50cm
Germination: 6–10 days at 20–25°C
Maturity: 8–12 weeks

Beans are very popular vegetables because they are easy to grow, occupy a small amount of space and are high yielding. All beans are frost tender and require warmth for germination and growth.



Dwarf varieties produce crops in 8 to 10 weeks from sowing and will produce over 2–3 weeks. Runner or climbing beans take 10–12 weeks to begin producing but crop over 10–12 weeks. Scarlet runner beans are perennials and if cut off just above ground level at the end of summer can be left to resprout the following year. They are also highly ornamental with their brilliant scarlet flowers. Before sowing apply 200g (4 handfuls) per square metre of Gro-Plus General Garden fertiliser. Work it well into the soil. Beans require constant warmth, night and day, with a minimum soil temperature of 16 degrees for reliable germination. Do not sow seeds while soil is cold or wet as this will result in poor germination and pale unthrifty growth. Sowings should be made at 2–3 week intervals to allow for a continuous supply. Sow from November until January or even February in warm districts.



Climbing beans require a fence or a trellis to grow on. A simple support can be made by stretching 2 wires one at the bottom at 15cm and one at the top at 2m between 2 posts. Garden twine can then be strung between the wires for the beans to climb. A bamboo tripod can aso be easily erected and 2–3 seeds sown at the bottom of each stake.

Water frequently during dry periods. Pick beans when young and tender. After the first picking the pods mature quickly and beans should be harvested every 2–3 days. This will also prolong flowering and harvest.

Major pests of beans are caterpillars, vegetable bug, leafhoppers and white fly, all of which can be controlled by spraying with Target. During summer, red spider mites can be a problem and should be sprayed with Mite Killer. To avoid sclerotinia rotate crops so that beans are not grown in the same area more than 1 year in 2. Extremely hot, windy conditions or lack of moisture may result in flowers not setting.

Varieties of Dwarf beans are:

Butter Golden Wax: a most popular home garden butter bean. Holds its quality over a long picking period. Seeds are black. Pods are bright yellow, slim and stringless. Adapted to a wide range of climatic conditions.

Green Beauty: a general purpose variety with long straight, pods. Plants are compact and vigorous. Seeds are light brown with faint darker veins. Quite resistant to rust. Suitable for spread picking.

Long John: strong-growing and heavy-yielding. Pods are stringless, fat and flavoursome, holding their quality well into late maturity with a minimum of fibre content. Seeds white. Resistant to common bean mosaic and top yellow virus. Suitable for freezing.

Royal Streak: an extra-long, flat,

podded selection. Excellent quality which holds well into late maturity. White seeds. Pods medium green. Quite resistant to top yellow virus.

Tendergreen: a popular snap pod, stringless bean. Seeds are a purple-brown mottled with fawn. Pods are round, dark green with some darker flecks. Resistant to common bean mosaic. Suitable for freezing.

Top Crop: an early maturing high yielding variety. Pods carried high on the plant. Seeds are brown with buff mottling. Pods stringless, round and medium green. Resistant to common bean mosaic. Suitable for freezing and canning.

Yatescrop: a snap pod, stringless bean. A very heavy cropper. Seeds are light buff or tan. Pods straight oval and medium green, containing very little fibre. Suitable for tropical conditions. Resistant to common bean mosaic virus.

Varieties of Climbing beans are:

Butter Goldfinger: a waxy variety with golden yellow pods, slightly curved. Brittle and meaty. First beans mature early and continue to fruit up the stem over a long period.

Mangere Pole: an excellent late-season cultivar. Superb quality, prolific bean. Strong and reliable. Pods are long, shiny dark green, stringless, flat and very attractive. Seeds are large flat and white. Recommended for all areas including tropical and temperate zones. Quite resistant to rust. Suitable for outdoor and glasshouse production.

Market Wonder: outstanding for its vigour and heavy yields. Bears prolific crops over the summer and early autumn. Long, fat fleshy pods, full of flavour. A white seeded selection of Fardenlosa.

Purple King: dark meaty tender pods, which turn bright green when cooked. Sturdy and vigorous plant which has prolific clusters of pods all the way up the vine. Has a long season and will harvest over 6–8 weeks.

Shiny Fardenlosa: an early and mid-season cultivar, prolific and vigorous. The attractive pods are long, flat, and a dark glossy green, straight and entirely stringless. The white seeds are large, flat and kidney-shaped. Long season producing over 6–8 weeks. Suitable for both outdoor and glasshouses.

Varieties of Scarlet runner are:

Empire State: an exceptionally long podded variety. Excellent flavour and heavy yielding. Pods set in heavy clusters up the vine. Sturdy and reliable grower. The large seeds are kidney-shaped and mottled purple and black. Pods are long, flat and dark green with a coarse skin with considerable fibre content at full maturity. Best picked when 25–35cm long. Not stringless.

Streamliner: a general purpose bean with long pods of a flat, medium green. Coarse skin, has some string. Will become fibrous if over-mature.



Beetroot
Sow: spring to autumn
Sow at depth: 1cm
Plant space: 10cm
Row space: 30cm
Germination: 10–14 days at 20°C
Maturity: 8–11 weeks from seed

A versatile root crop which is easy to grow most of the year and can be eaten as a hot vegetable or cold as a salad vegetable, beetroot requires free-draining soil, with ample nutrients and water. It will not do well in poor soil or in very hot weather unless watered frequently. Work compost or peat into the soil and add 200g (4 handfuls) per square metre of Gro-Plus General Garden fertiliser prior to planting.

Beetroot is best sown direct in the soil in rows or drills. The 'seed' is actually a group of 2–4 true seeds in a corky cluster. Thin the seedlings early to 3–5cm apart and later when roots develop to 10cm apart. Beetroot can also be raised in containers and later transplanted.

It is important that beetroot be kept growing actively, so water it in dry weather and fertilise with Lush. Uneven growth can be caused by irregular watering. Harvest when each root is the size of a tennis ball, before they become

fibrous and white rings develop. Beetroot is virtually free of pests and diseases. Leaf spots or rust can be controlled with Bravo if infestations are severe. Plants bolting (running prematurely to seed) can be caused by a cold spell in weather followed by warmer temperatures, or other factors causing a check in growth.

Varieties are:

Cylindra: a dark, blood-red variety with long cylindrical roots. Free from white rings and excellent for slicing. Smooth skins remove easily after cooking. Matures in 9 weeks from sowing seed.

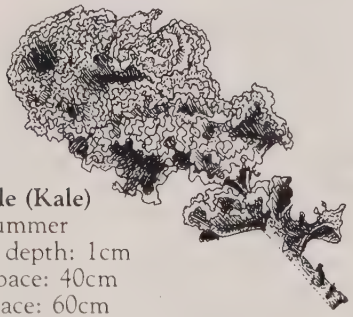
Derwent Globe: a dark red, globe-shaped root. Tender and sweet. Matures in 9 weeks from sowing seed.

Early Wonder: has a dark red, ball-shaped root. Suitable for early or late sowings. Matures in 8 weeks from seed.

Golden Beet: has golden-yellow roots which do not bleed. Tops can be boiled. Mature in 11 weeks from sowing seed.

King red: has dark red, globe-shaped root and a smooth, fine texture free of rings. Matures in 8 weeks from sowing seed.

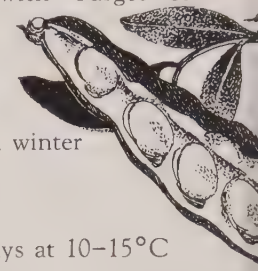
Turnip Rooted: has a purple-red, flattened, globe-shaped root. Tender and free from fibre. Tall, vigorous tops. Matures in 8 weeks from sowing seed.



Borecole (Kale)
Sow: summer
Sow at depth: 1cm
Plant space: 40cm
Row space: 60cm
Germination: 10 days at 20°C
Maturity: 13 weeks onwards

Sometimes known as Scotch Kale or Curly Greens. The leaves are likened to a loose-leafed cabbage. Borecole is very hardy and will perform best in cold climates in soils where cabbages normally thrive. The young curled leaves can be harvested as required. Prior to planting work in 200g (4 handfuls) per square metre of Gro-Plus General Garden fertiliser.

Sow seed in rows or drills or raise in seed trays and transplant. Protect from slugs and snails with Blitzem or Mesurol. The major pests, aphids and caterpillars, can be controlled with Target or Orthene.



Broad Beans
Sow: late autumn and winter
Sow at depth: 5cm
Plant space: 10cm
Row space: 1m
Germination: 7–14 days at 10–15°C
Maturity: 13–17 weeks

Broad beans are a popular cool season vegetable and give a useful crop in spring and early summer when other green vegetables are scarce.

Like most legumes, broad beans need good drainage and prefer a light, fertile soil. Apply 200g (4 handfuls) per square metre of Gro-Plus General Garden fertiliser before sowing seed. Sow seed in either single or double rows. The plants may need some form of support, particularly if they are exposed to the wind. Drive 1 metre stakes into the soil at regular intervals alongside the bean rows, stretching garden twine at a height of 30cm between the stakes.

Flower drop, particularly in early spring, is a common problem. Seed setting usually improves when the weather becomes warmer and bees are more active.

Nipping off the top of the plants will increase the size of pods and stop the plants growing taller. The growing tips can be cooked like spinach.

Pods can be harvested before the beans inside are formed and sliced like french beans. (Pods approx. 5–10cm long.) For the best broad-bean flavour, use shelled beans from the mature pods. Pick when the beans are well formed, but before the pods become tough. Take a few at a time from each plant starting with the bottom clusters. This will encourage the development of the remaining pods.

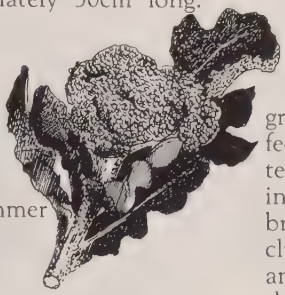
After the crop has been harvested the foliage can be cut down and dug into the

soil. Broad beans also make an excellent green crop if dug into the soil when they are about 20–30cm high. The following chart outlines the most common problems encountered when growing broad beans.

Varieties are:

Evergreen: a green-seeded variety. Very tender and succulent beans which remain bright green when cooked. The beans are smaller than other cultivars and have a mild flavour. Suitable for fresh use or freezing.

Exhibition Long Pod: a particularly sturdy broad bean. The pods are thick, fleshy and approximately 30cm long. Ideal for all districts.



Broccoli
Sow: spring and summer
Sow at depth: 1cm
Plant space: 45cm
Row space: 60cm
Germination: 10 days at 20°C
Maturity: 10–12 weeks from transplanting

Broccoli is becoming an increasingly popular home garden vegetable and for good reasons. It is highly productive and a single plant gives a continuous supply of tasty greens for many weeks. It is also extremely nutritious, being an excellent source of Vitamins C and A and containing calcium and fibre.

Sprouting broccoli has a central cluster of green flower stalks and smaller clusters arise like 'sprouts' along the stems. Broccoli does best in temperate and cool climates. Seeds should be sown in summer for a winter and early spring harvest. Sprouting broccoli likes a sunny, sheltered position in a deeply worked soil with plenty of organic matter.

Work in a base application of 200g (4 handfuls) per square metre of Gro-Plus General Garden fertiliser prior to planting. Seed can be sown direct into soil or alternatively raised in seed trays and later transplanted. Any stress or check in growth at this stage is likely to cause buttoning of plants.

Broccoli, like all leaf crops, needs to be grown quickly and will respond to liquid feeds of Lush. Extreme variations in temperature may cause leaves to appear in the flower head. Harvest sprouting broccoli when the centre green bud clusters are still tight and before there is any yellow flower showing. After cutting the main head, fertilise with Lush and water. The plant will continue to produce side shoots, provided the harvested shoots are not cut back to the main stem.

Bait with Blitzem or Mesurol to control slugs and snails. Major pests are aphids and caterpillars which can be controlled with Target or Orthene. To avoid club root, rotate crops so that broccoli and other members of the brassica family are

SOLVING PROBLEMS WITH BROAD BEANS

Problem	Cause	Solution
Flower drop before set	Cool weather, lack of bees for pollination	Plant late in season
Excessive leaf growth	Too much nitrogenous fertiliser	Use a balanced N.P.K. fertiliser e.g. Gro-Plus General Garden fertiliser
Growing tips deformed with clusters of insects	Aphids	Spray with Orthene
Dark brown or black spots on leaves	Chocolate spot (Botrytis)	Spray with Bravo at 14-day intervals
Red or purple raised rust pustules particularly on undersides of leaves	Rust	Spray with Bravo at 14-day intervals

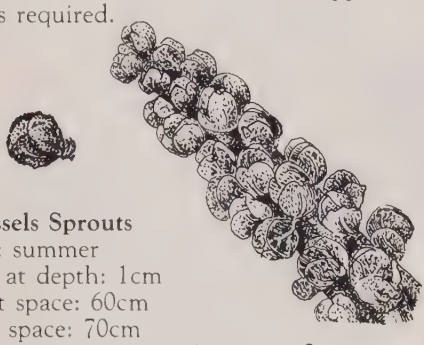
not grown in the same area more than 1 year in 3.

Broccoli is easily prepared by boiling or steaming. The flavour is delicate and it should not be overcooked. It is an excellent vegetable for freezing.

Varieties are:

Triumvirate: this consists of three different hybrids which mature over a three to six month period, allowing for a natural succession of harvesting.

Romanesco: a unique Italian broccoli with a fabulously smooth texture. Individual arrow heads can be snapped off as required.



Brussels Sprouts
Sow: summer
Sow at depth: 1cm
Plant space: 60cm
Row space: 70cm
Germination: 10–14 days at 20°C
Maturity: 16–20 weeks

Brussels sprouts have a distinctive flavour of their own. They are suited to cool climates although the hybrid Drumtight performs more reliably in warmer districts.

Brussels sprouts will do well in most garden soils but prefer a deep, free-draining soil rich in organic matter. Seed can be sown direct in the soil in rows or raised in seed trays and later transplanted.

Prior to sowing, work into the soil 200g (4 handfuls) per square metre of Gro-Plus General Garden fertiliser. Side dressing at the same rate three months later can also be made. The sprouts mature in sequence from the bottom up. Remove lower leaves as sprouts are harvested. Loose fluffy sprouts may be caused by excess nitrogenous fertiliser.

Protect from slugs or snails with Blitzem or Mesurol pellets. The major pests, aphids and caterpillars, are controlled with Target or Orthene. The fungus disease downy mildew can also be a problem and is best controlled with Bravo.

To avoid club root, rotate crops so that brussels sprouts and other members of the brassica family are not grown in the same area more than 1 year in 3.

Brussels sprouts are an excellent source of Vitamin C and Folic Acid. They are normally steamed or boiled.

Varieties are:

Drumtight: hybrid. Firm sweet sprouts. Prolific producer in range of conditions.

Emerald Ball: large, solid sprouts tightly packed up the stem.



Cabbage
Sow: all seasons
Sow at depth: 1cm
Plant space: 45cm
Row space: 60cm
Germination: 10–14 days at 15–30°C
Maturity: approx. 10–14 weeks from transplanting

Cabbage is a popular vegetable, adapted to a range of climates and grown virtually all year round. The use of cabbage for coleslaw has made it an important summer vegetable as well as winter. They are a good source of vitamin C and fibre.

Cabbages grow well in most garden soils but do best in a deep, free-draining soil rich in organic matter. Prior to sowing work into the soil 200g (4 handfuls) per square metre of Gro-Plus General Garden fertiliser.

Seed can be sown virtually all year round in warm districts and from early spring to autumn in cold districts. Sow seed direct into garden soil or alternatively raise in seed trays and later transplant.

Protect emerging seedlings or transplants from slugs and snails with Blitzem

and Mesurol pellets. As cabbages are a fast-growing leafy vegetable they respond to a side dressing of sulphate of ammonia when they are half grown.

Major pests to cabbages are aphids and caterpillars, controlled with Target or Orthene. Downy mildew and ringspot are controlled with Bravo.

To avoid club root, rotate crops so that cabbages or other members of the brassica family are not grown in the same area more than 1 year in 3.

Cabbages with split heads may occur if rain follows a long dry period.

Varieties are:

Early Drumhead: a sturdy, reliable and excellent maincrop variety. Heads are large, solid and semi-round. Vigorous. Plant spring/autumn/winter for spring and summer harvest. Matures in 12–14 weeks from transplanting.

Flower of Spring: a small, conical-headed variety. Hardy and reliable. Plant autumn/winter for early spring harvest. Matures in 11 weeks from transplanting.

Golden Acre: the smallest and earliest of round-headed varieties. Compact plant with firm drumhead. Sow in early spring/summer for summer/autumn harvest. Matures in 10 weeks from planting.

Green Gold: a hybrid, excellent winter cabbage. Plant summer and autumn. Large, vigorous green leaves with good wrapper leaves. Firm, solid head, flattened semi-globe shape. Matures in 12–14 weeks from transplanting.

Jubilee: a large, vigorous, flattened drumhead hybrid. Plant spring/summer and autumn. Matures in 13–14 weeks from transplanting.

Prize Red: a large drumhead type with deep red colour. Sow in spring and summer for summer/autumn harvest. Use for pickling, coleslaws or as a steamed vegetable. Matures in 12–13 weeks from transplanting.

Savoy Drumhead: a round, medium-sized green cabbage. Vigorous and long-stemmed. Plant summer and autumn for winter harvest. Matures in 14 weeks from transplanting.

Succession: a large, vigorous, pale green cabbage. Plant spring/autumn and winter, for summer and spring harvest. Matures in 12–14 weeks from transplanting.

Winter Pride: a compact firm, medium-sized cabbage. Plant autumn/winter. Matures in 13–14 weeks from transplanting.



Capsicum (Sweet Pepper)
Sow: spring
Sow at depth: ½cm
Plant space: 50cm
Row space: 60cm
Germination: 6–14 days at 20°C
Maturity: 10–16 weeks

Generally sweet peppers require a warmer, longer summer than tomatoes. They can be picked at the green stage or left for a further 3–4 weeks to turn yellow or red. They will not set fruit at low or very high temperatures or under dry conditions.

Seed is best sown in early spring in peat pots in a warm sheltered place and later transplanted when the weather is warm and settled. The soil should be deep and well drained with plenty of organic matter. Apply 200g (4 handfuls) per square metre of Gro-Plus General Garden fertiliser.

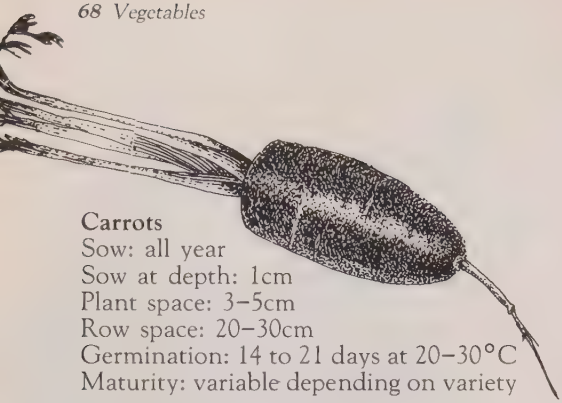
Protect from slugs and snails with Blitzem or Mesurol pellets. Water regularly during dry weather.

The major pests are caterpillars, which are controlled with Target or Orthene. To help avoid various soil diseases rotate peppers so they are not grown in the same area more than one year in three.

Varieties are:

Golden Bell: an early, sweet, green fruit turning to gold. Hybrid.

Yolo Wonder: has firm, thick and glossy, dark green fruit turning to red. Sturdy, upright plants 45–60cm tall, dark green foliage and pendant fruiting habit. Continuous picking type. Quite resistant to tobacco and mosaic virus. Matures from transplants in 10–11 weeks.



Carrots
Sow: all year
Sow at depth: 1cm
Plant space: 3–5cm
Row space: 20–30cm
Germination: 14 to 21 days at 20–30°C
Maturity: variable depending on variety

Carrots are quick and easy to grow, taking little space in the garden. They are extremely rewarding and a delight to eat straight from the garden. Carrots are an excellent source of Vitamin A, which is present in the reddening pigment of carotene; they also contain calcium and potassium.

Carrots can be sown almost any month of the year, although midsummer sowings are often avoided because of dryness. Deep sandy or volcanic soils with a good structure allowing roots to grow and expand quickly will give best results. Regular sowings will ensure a continuing supply for most of the year.

Work 100g per square metre (2 handfuls) Gro-Plus General Garden fertiliser into soil. Sow seed in rows or drills, tapping seeds gently from the packet. Cover with seed-raising mix or soil, and water gently. Keep the seed bed damp until carrots germinate and when seedlings are 5cm high, thin them to 2–3cm apart. Later when 15cm high, thin again to 5cm apart. The seedlings at this stage should have tender roots large enough to eat.

Carrot Rust Fly is an annoying pest of carrots, particularly in warmer areas of New Zealand. While carrots are the most seriously affected, parsnips, parsley and celery are also attacked. Carrot Rust Fly damage is most severe in summer but can be present all year round. The damage

SOLVING PROBLEMS WITH CARROTS

Symptom	Cause	Treatment
Branched and misshapen roots	Stones, clods or lumps of bulky organic manure in soil	Prepare a deep crumbly well drained soil which allows roots to expand and grow quickly
Pale colour	Pale variety (e.g. Egmont Gold), strongly acid soil or excess Nitrogen, or high temperatures during growth	Plant deeply coloured carrot, e.g. Redheart, Manchester table or add lime to soil and avoid nitrogen fertiliser: potash increases intensity of colour
Seedlings burn off	Hot sunny weather at tender stage of growth	Sprinkle with water, keep soil moist
Green tops on carrot roots	Sunlight on exposed crowns	Pile earth up to cover crowns during growth
Roots cracked or split	Interior of carrot grows faster than skin which can be caused by heavy rain following a dry spell or over-fertilising	
Bolting – running to seed prematurely without forming roots	Seedlings subject to cool weather	
Excessive leaf growth	Excess nitrogen	Avoid nitrogenous fertilisers, and use balanced ones

is caused by a larva or grub which burrows into the roots to feed. The tunnelling makes a considerable mess, and also allows fungi and bacteria to enter the root and cause further damage. Plant tops may also wilt. To help avoid this, rotate carrots so they are not grown in the same area more than one year in three. Diazinon granules placed in the seed furrows at planting and repeat applications at 8–12 weeks after planting provide the most effective method of control. Other problems which can occur with carrots are mainly physiological. The following chart describes these.

Varieties are:

Chantenay: a popular stump-rooted variety. Free from yellow core. Suitable for all districts. Sow spring to mid-summer. Matures in 10–12 weeks from seed.

Earlycrop: an early, stump-rooted variety. Excellent interior colour, bright orange and uniform quality. Matures in 10–12 weeks from seed.

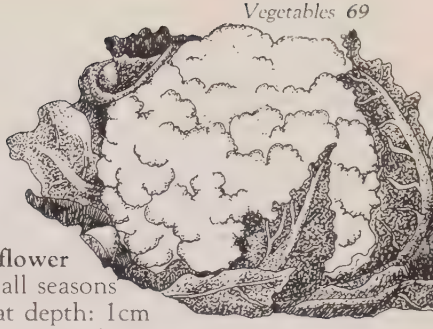
Egmont Gold: a large, pale carrot. Strong and vigorous, sweet, with a long tapering root. Sow early spring to mid-summer. Matures in 14–17 weeks from seed.

Little Finger: this is the finest baby carrot, with high-quality roots free from splitting. Small, up to 15cm long; smaller when planted at higher densities. Smooth skin, small core and excellent deep red colour. Crisp, tender and flavoursome. Sow early spring to midsummer. Matures in 9–11 weeks from seed.

Manchester Table: a uniform, high-quality carrot. Long, cylindrical, with blunt end. Smooth and waxy skin. Crisp, brittle and sweet. Flesh is fine-grained, free of core and deep orange. Sow spring to mid-summer. Matures in 12–13 weeks from seed.

Redheart: a deep red carrot, sweet and tender, with tapering roots and small core. Sow spring to midsummer. Resistant to bolting. Matures in 12–13 weeks from seed.

Topweight: a high-yielding, vigorous carrot. An early or main crop variety with large, even tapering roots. Good early colour. Resistant to bolting. Matures in 12–13 weeks from seed.



Cauliflower
Sow: all seasons
Sow at depth: 1cm
Plant space: 45cm
Row space: 60cm
Germination: 10–14 days at 15–20°C
Maturity: 4–5 months from transplanting.

Cauliflowers are a valuable winter vegetable rich in Vitamin C. They are more suited to colder climates as they require low temperatures to start the development of the curd. They do well in warm climates when sown in the summer or autumn for winter use.

Cauliflowers require the same deep, free-draining soil as do broccoli and cabbages. Prior to sowing apply 200g (4 handfuls) per square metre of Gro-Plus General Garden fertiliser. Sow seed direct into the garden or raise in trays and transplant later. When the crop is half grown a side dressing of fertiliser will help curd develop. During periods of hot weather the maturing heads may discolour. This can be avoided by breaking the outer leaves inwards and laying over the head to protect it. Water frequently in dry weather. If young plants receive a check in growth they are likely to form very small button heads or bolt (i.e. run prematurely to seed).

Major pests are aphids, caterpillars and white fly which are best controlled with Target or Orthene.

To avoid clubroot rotate crops so that cauliflower and other members of the brassica (cabbage) family are not grown in the same area more than 1 year in 3.

Varieties are:

All Year Round: which has firm, white curds. Sow in summer. Mature four months from transplanting.

Deepheart: with a large, very white deep head, well protected. Plant mid-summer to late summer. Matures five months from transplanting.

Mini: a unique, early maturing mini-

cauli. Very easy to grow. Plant close together. Ideal for small gardens. Solid snow white heads on small compact plants. Sow during summer, plants mature three months from transplanting.

Phenomenal 4-Month: an easy early variety. Medium sized head, white and well protected. Consistent performer under most conditions. Plant in summer. Matures in four months from transplanting.



Celeriac
Sow: spring
Sow at depth: 1cm
Plant space: 20cm
Row space: 40cm
Germination: 12–18 days at 15°C
Maturity: 30–35 weeks

Celeriac is a turnip-rooted celery. The tops may be used as celery and the tuberous roots can be grated for salads or used in soup and stews. Their cultivation is similar to that of celery.



Celery
Sow: all seasons
Sow at depth: ½cm
Plant space: 30–40cm
Row space: 30–34cm
Germination: 14–21 days at 20°C
Maturity: Approx. 16 weeks

An excellent home garden vegetable, as the outside stalks can be harvested as required. In warm areas celery can be grown most of the year, with spring-sown crops maturing in summer, and autumn-sown crops maturing early winter.

Celery grows naturally in wet, almost boggy soils. The weak fibrous root system is unsuited to poor hard soils. The soil must be deep and well prepared with plenty of organic matter. Apply 200g (4 handfuls) per square metre of Gro-Plus General Garden fertiliser.

Celery seed is slow to germinate and often erratic. It is therefore best to raise in trays and transplant out when 8cm high. Water regularly. The main pests – aphids – are controlled with Orthene or Target. The main diseases are Septoria leaf spot and rust which are controlled with Bravo.

Bolting may be caused by irregular watering, or cold weather followed by a warm spell. Split stalks can be due to dry soil and an excess of nitrogen in soil. Use a balanced fertiliser.

The recommended variety is **Dewcrisp Green**.

Chicory
See Endive



Chinese Cabbage
Sow: spring
Sow at depth: 1cm
Plant space: 25cm
Row space: 25cm
Germination: 10–14 days at 20°C
Maturity: 8–10 weeks

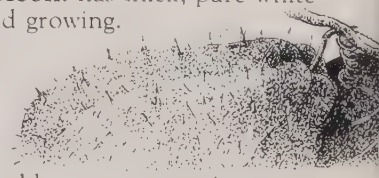
This vegetable is a close relation to cabbage and a very popular vegetable in Asia. The plants are smaller than ordinary cabbage, and more upright with loose heads. The leaves have a texture resembling lettuce but with a mustard-like flavour. Grow in the same way as cabbage but sow in spring for a summer harvest. (They tend to bolt in cool weather.) Use in salads or coleslaw or cook in the same way as cabbage.

Varieties are:

Chi-hi-li: a tall, thin vigorous variety. crisp and tender.

Wong Bok: an old, Chinese, barrel-shaped variety.

Kwang Moon: has thick, pure white stalks. Rapid growing.



Choko
These vegetables are grown in warm

climates only, as they need a long growing season with freedom from frost. Plants are very vigorous and if allowed to run freely will cover many square metres. They are best trained on a trellis where a single plant can produce many fruits. A new plant is obtained by planting a sprouted fruit in spring, in well prepared soil rich in organic matter. Plant with the shoot just below soil level. Plants started in spring will fruit in late summer. Pick when fruit is green and 5–7cm long, before it becomes coarse and loses flavour. In winter, cut back old vines to 2–4 shoots for next season's growth.



Cress
Sow: all year
Sow at depth: 1cm
Plant space: 1–2cm
Row space: 10–15cm
Germination: 4–5 days at 20–30°C
Maturity: 6 weeks

Cress makes a tasty addition to salads, sandwiches and garnishes. It is easy and quick to grow, and can be eaten as sprouts after 10 days or later in all stages of maturity. Cress is best grown in early spring or autumn. For tender leaves give the plants plenty of water and fertiliser. See watercress also.



Cucumber
Sow: summer
Sow at depth: 1–2cm
Plant space: 20cm
Row space: 1m
Germination: 5–10 days at 15–20°C
Maturity: 8–10 weeks

Cucumbers are a popular salad vegetable and are easy to grow. Gherkins (pickling cucumbers) are small, immature cucumbers harvested when fruit is 5–10cm long.

They are a warm weather plant requiring soil temperatures of 15°C for good germination.

Sow seed in peat pots and keep in a warm place. Plant 2 or 3 plants at a time 3–4 weeks apart over the summer to ensure picking over a long period. Cucumbers need a warm sheltered area. To save garden space they can be grown on a fence or trellis about 1.5 metres high. Use strings, wires or netting for supports. Fruit not in contact with the ground will be much improved in quality and shape.

While it is not proven, it is thought that bitterness can be caused by irregular water supply or a cold growing season, but most importantly, fruit must not be left to over-mature.

Cucumbers are often attacked by aphids and white fly which can be controlled by spraying with Target. Mites, which cause a severe yellowing and dehydration of plants, are common in hot dry weather. They are best controlled with Mite Killer. The major disease of cucumbers is powdery mildew. Spray plants at 2 weekly intervals with Saprol or Benlate.

To avoid various soil diseases rotate crops so that cucumbers are not grown in the same area more than one year in three.

Varieties are:

Apple Shaped: gives prolific crops of apple shaped, crisp, tender fruits. Creamy white skin. Hardy and easy to grow. Matures in 10 weeks from seed.

Burpless: vigorous, long green cucumbers. Free of bitterness, and burpless! Smooth, tender skin. Matures from seed in 9 weeks.

Gherkin Pickling: a small, fleshy cucumber, ideal for use as gherkins. Black spiny, pale green skin. Matures from seed in 8 weeks.

Mangere Prize: long green cucumbers,

mild tasting, white crisp flesh. Vigorous, with good disease resistance. Matures in 9 weeks from seed.

Money Maker: an excellent, long, slim variety suited for slicing. Dark green skin with white spine. Vigorous, with good disease resistance. Matures in 9 weeks from weed.

Pot Luck: an early dwarf hybrid. Small, compact, and heavy yielding. High quality, deep green cucumbers up to 15cm long. Easy to grow and perfect as a container plant. Tolerant to cucumber mosaic virus. Matures from seed in 8 weeks.

Slicemaster: a high yielding hybrid. Very uniform and high quality. Long straight, with taper at blossom end. White spine. Uniform, smooth and dark green skin. Disease resistant. Matures from seed in 8 weeks.

Short Green Glacier: an excellent early green variety. Fruit is cylindrical, blocky with slight taper at both ends. Suitable for pickling gherkins when immature. Matures in 8 weeks from seed.

Sweet Oriental: a long, thin cucumber resembling the telegraph type. Delightfully nutty with a sweet skin which is free from bitterness, and burpless. Plants should be trained on a fence or trellis so fruit hangs free. Vigorous and high yielding. Matures in 8 weeks from seed. To avoid bitterness with this variety, harvest when fruit has a diameter of between 20 and 25mm.



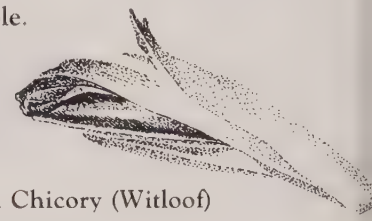
Eggplant (Aubergine)
Sow: spring and summer
Sow at depth: ½cm
Plant space: 1m
Row space: 50cm
Germination: 7–14 days at 20–30°C
Maturity: approx. 10 weeks

Eggplant requires a long, warm growing season and fertile, free-draining soil.

Work in 200g (4 handfuls) per square metre of Gro-Plus General Garden fertiliser before planting. Sow seed in individual pots in early spring for planting out later when the soil is warm. When the plants have set fruit, apply a side dressing of 100g (2 handfuls) per square metre of fertiliser. Once fruit is set the crop should be limited to 6 fruit per plant. Keep soil moist and foliage dry.

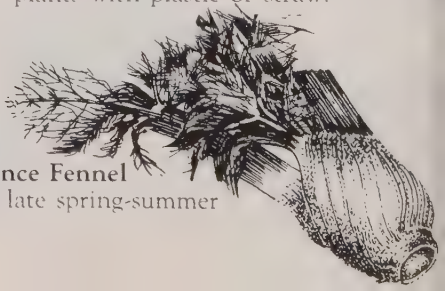
A short stake may be necessary to tie plants when laden with fruit or in exposed sites.

Harvest fruit when skin is smooth and a rich purple colour. The hard woody fruit stalks will need to be cut with secateurs to avoid damaging the plant. Regular picking encourages fruiting. Eggplants sometimes suffer from attacks from blight and leaf spots which can be prevented by spraying with Bravo. The major pests are caterpillars and these are controlled with Target. The recommended varieties are **Blacknite** and **New York Purple**.



Endive and Chicory (Witloof)
Sow: autumn
Sow at depth: ½cm
Plant space: 20cm
Row space: 20cm
Germination: 7–10 days at 20–25°C
Maturity: 11 weeks

Both these vegetables are grown as salad greens and the leaves are used as an alternative or addition to lettuce or spinach. The serrated frilled leaves of endive form a loose heart. The leaves of chicory (witloof) are larger and the heart more compact. They are grown in the same manner as lettuce but for a winter harvest. The leaves may have a slightly bitter taste which can be removed by blanching: 2–3 weeks before cutting, cover plants with plastic or straw.



Florence Fennel
Sow: late spring-summer

Sow at depth: ½cm
Plant space: 20–25cm
Row space: 40cm
Germination: 10–14 days at 20°C
Maturity: 12–16 weeks

A popular Italian vegetable with a clean, crisp texture and unique aniseed flavour. The thickened stem base can be eaten raw or cooked in a variety of dishes. Use like celery. Raise in trays of seed-raising mix. Transplant after 4–6 weeks. Best grown in full sun in a fertile well drained soil. Water and liquid-fertilise regularly. Grow quickly to avoid bolting. When half-grown, hill up soil around base to blanch stems. Grows 60cm high.



Garlic
Garlic is a close relative of the onion and is normally established by planting small individual cloves or sections of the parent bulb in winter. Prior to planting work in 200g (4 handfuls per square metre) of Gro-Plus General Garden fertiliser. Set cloves out 10cm apart and 2cm deep.

Apart from weeding they should require very little attention. Harvest in midsummer when the tops fall over. Lift the bulbs from the soil and lay out in a ventilated sunny area to dry for one to two weeks. They can then be braided into strings or tied in bunches to hang in a cool dry place.

There are three types of garlic available. The common white garlic; a larger, more mild flavoured elephant garlic, and red garlic. Garlic is relatively free of pests and diseases but heavy infestations of mites can affect the storage.

To avoid nematode infestations, rotate crops so that garlic is not grown in the same area more than 1 year in 3.

Gherkin
See Cucumber



Kohl Rabi
Sow: all year round
Sow at depth: 1cm
Plant space: 5cm
Row space: 20–30cm
Germination: 12–15 days at 20–25°C
Maturity: 9–10 weeks

This unusual root vegetable, similar to a turnip but with a more refined flavour, deserves to be grown and appreciated more. It grows above ground sprouting leaves from most of the surface and has a mild, sweet flavour. Kohl Rabi grows in the coldest gardens in New Zealand and yet still performs well in the warm areas. It can be grown all year round but for best results sow in summer and autumn for winter and early spring use.

Kohl Rabi will grow in most garden soils but a free-draining soil is best. Incorporate compost and 200g (4 handfuls) per square metre of Gro-Plus General Garden fertiliser before sowing. Sow direct into garden soil in drills. Cover with fine soil, firm down and keep moist. Thin to 15cm apart when 5–10cm high. Water and liquid-fertilise regularly. Harvest when the base reaches 6–8cm in diameter. Under adverse conditions or left to over mature they may become tough. Aphids and caterpillars can be controlled by spraying with Target or Orthene.

To avoid clubroot, rotate crops so that Kohl Rabi and other members of the brassica (cabbage) family are not grown in the same area more than 1 year in 3.



Kumara (Sweet Potato)
The kumara or sweet potato is a popular New Zealand vegetable. They are tender plants of tropical origin, needing a 5-month growing season with temperatures above 17°C.

An open, free-draining topsoil to a depth of 20cm with a firm base sub-soil is ideal. If the soil is too loose or too deep the roots continue to grow down or spread and do not thicken, and the tops make excessive growth.

Kumaras are grown from cuttings or

plants which are normally available from garden centres and nurseries in spring. To raise your own, place a kumara in a box of sand and place in a warm position. The rooted sprouts can be carefully pulled from the tuber after 5–8 weeks (1 large tuber will produce 30 shoots). Prior to planting work in 100g (2 handfuls) per square metre of Gro-Plus General Garden fertiliser. Plant on raised ridges (as for potatoes) to improve drainage and make harvesting easier. Regular watering is important in the 3–5 months when the tubers are filling out rapidly.

Apart from weed control in the early stages kumaras are easy to care for and do not suffer from any major pests or diseases.

To minimise nematode infestation, rotate crops so that kumaras are not grown in the same area more than 1 year in 3.

Tubers can be dug 3–4 months after planting for immediate use. Wait until plants have yellowed and tubers are fully mature before digging tubers intended for storage and winter consumption. Discard any diseased or damaged tubers.

Dry thoroughly by leaving in the sun for a few days to cure. They can then be stored in a dry, airy place. Handle carefully as they are bruised easily.

Kumaras improve during storage because part of their starch content turns to sugar.



Leek
Sow: summer-autumn
Sow at depth: 1cm
Plant space: 15cm
Row space: 15cm
Germination: 14–21 days at 15–20°C
Maturity: 21 weeks

Leeks are a member of the onion family and are cultivated for their fleshy white stems. They are a hardy and a very useful winter vegetable, holding well over a long period of autumn, winter and early spring.

Leeks can be grown from seed, in trays, boxes or a seed bed and transplanted out later. Alternatively they can be directly sown in rows or drills and thinned out to 15cm between plants. Leeks can be sown all year round but they are normally sown in summer for use in winter or early spring.

A deep, free-draining soil with added organic matter such as compost or peat is best. Work in 200g (4 handfuls) per square metre of Gro-Plus General Garden fertiliser prior to planting. Leeks need regular watering and respond to liquid fertiliser every 2–3 weeks which promotes plump tender stems. Harvest when stems are at least 2cm thick.

Leeks are rarely affected by pests and diseases.

Musselburgh is the most widely grown variety in New Zealand.



Lettuce
Sow: all year
Sow at depth: 1cm
Plant space: 25cm
Row space: 25cm
Germination: 7–10 days at 20–25°C
Maturity: 8–13 weeks

Lettuce is the world's most popular salad plant. It is also a plant of great antiquity, having been cultivated 2,500 years ago in the royal gardens of the Persian Kings.

Many hundreds of varieties of lettuce

have been bred over the years and today the main types available are:

- Crisphead lettuce which has large wrapper leaves, usually frilled or blistered, covering the head.
- The butterhead lettuce, which has rounded or plain leaves which do not wrap around the head but form a close rosette.
- Loose-leaf lettuces, which do not form a head. The leaves can be picked progressively in the same way as spinach or silverbeet.
- Cos or romaine lettuces, which have an upright growth with tall heads and rather stiff leaves.

Mostly we think of lettuce crisp in salads with a favourite dressing. However, it is excellent stir fried with butter and nutmeg or mushrooms and onions. Lettuce soup with a dash of curry is another excellent way of using up outside leaves.

Lettuces must be grown quickly and without a check (a slowing in growth) if they are to be sweet and crisp. They require plenty of moisture and fertiliser. A sheltered warm position is necessary for spring and winter-grown lettuce. However summer grown lettuces do better in shade. Always use fresh seed. Opened packets of lettuce seed often lose germination quickly. Lettuce seed can either be sown direct in the garden, sowing in rows or drills. When first true leaves appear, thin to 10–15cm apart and later 20–30cm. Alternatively, raise in containers and transplant later. In hot weather direct seeding is recommended as the shock of transplanting may cause the plants to bolt (run prematurely to seed).

Lettuce is commonly attacked by slugs and snails. Protect with Blitzem or Mesurol. Sclerotinia (brown slime heart) is common under wet conditions and when the plants are grown in the same soil in successive years. Spray with Benlate and rotate crops so that lettuces are not grown in the same area more than 1 year in 3.

Downy mildew may be prevalent in cooler weather causing yellowing of leaves and slow growth. Spray with Bravo or Copper Oxychloride.

Varieties are:

Crisphead

Webbs Wonderful: a large medium lettuce with heavily crumpled leaves. Head firm and crisp. Matures from seed in 12 weeks.

Great Lakes: a summer variety. Large and trim head. Leaves crumpled and slightly frilled. Matures from seed in 12 weeks.

Yatesdale: a summer variety, performs well in hot weather. Dark green head. Crumpled, blistered and lightly frilled leaves. Crisp. Matures from seed in 12 weeks.

Triumph: an autumn and winter variety. Dark green, compact head. Heavily blistered and frilled leaves. Matures from seed in 13 weeks.

Butterhead

Tom Thumb: an early, very small lettuce. Suitable for intercropping in spring. Matures in 8 weeks from seed.

Mignonette: a small, compact lettuce. Does well in light soils and hot summers. Suitable for warmer climates. Leaves lightly crumpled and frilled. Matures in 8 weeks from seed.

Buttercrunch: tolerant to heat and performs well under a range of conditions. Pale green head. Small, compact and crisp. Matures from seed in 9 weeks.

Sweet Butter: a high quality butterhead lettuce. Very sweet and tender. Matures in 8 weeks from seed.

Looseleaf

Red Sails: a unique, highly nutritious lettuce with attractive bronze-red leaves. The leaves can be plucked as required. Because this lettuce has a greater leaf area exposed to the sun it has a high nutritional content. Red Sails contain 6 times the amount of Vitamin A, twice the amount of Vitamin C and 6 times the amount of iron as found in Crisphead varieties.

Cos or Romaine

White Cos: grows up to 35cm tall. Slow bolting type, suitable for tropical use. Thick, large, soft leaves. Mild and succulent. Ideal for continuous picking of outer leaves. Matures from seed in 9 weeks.



Marrow – courgette and zucchini
Sow: spring and summer
Sow at depth: 2cm
Plant space: 60cm
Row space: 1m
Germination: 5–10 days at 20–30°C
Maturity: 8–17 weeks

Marrows, although requiring warm conditions, are probably the hardiest of the cucurbit family and can be one of the first planted in spring.

Courgettes are baby fruits about the size of a cigar; zucchini are the same fruit when 15–20cm long; marrows are the mature fruit. Scallopini are small scallop-shaped vegetables with a similar flavour.

The newer bush varieties of courgette, zucchini and scallopini are very popular as they do not take up a lot of space and produce up to 50 fruits per plant over an 8–10 week period if regularly picked. Marrows need more space and are best planted in an area that allows spread of up to 1 metre.

Plants can be raised from seed sown in peat pots indoors ready for planting out when danger of frost is over. Alternatively seed can be sown direct into garden soil in raised beds in spring when the soil has warmed sufficiently.

Add plenty of organic matter and 200g (4 handfuls) per square metre of Gro-Plus General Garden fertiliser prior to planting. Water regularly in dry periods. Further sowings can be made 8 weeks apart until midsummer.

Marrows are very susceptible to powdery mildew which is controlled by spraying with Benlate or Saprol. They are also attacked by white fly and caterpillars which are controlled with Target.

Varieties are:

Courgette: a good all-rounder for courgette and marrow production. Bush habit. Cylindrical, straight and slender fruit with slight ridges. Dark green at zucchini stage, turning black-green at full maturity. Flesh is greenish-white and firm. Fine quality. Matures 8 weeks from seed or marrows 17 weeks.

Courgette Gold 'N' Black: A popular mix of two quality hybrids. Dark, blue-green, glossy, cylindrical and smooth fruits plus deep, golden-yellow fruits with white flesh and straight cylindrical shape. Vigorous, upright bush plant. Mature from seed 8 weeks on.

Long Green Bush: an old favourite in home gardens. Bush habit. Striped fruit, light and dark green turning green and yellow to orange at maturity. Long and cylindrical slightly bulbous at blossom end. Matures in 17 weeks from seed.

Patty Green Tint: a prolific early scallop hybrid with a light green colour. Harvest when small (8–10cm). Bush plant with open habit. Round scallop-type fruit with small blossom scar. High yielding, matures from seed 7 weeks on.

Scallopini: an unique hybrid with scallop shape and nut-like flavour. Medium large bush with open habit. Fruits early in the season. 8–10cm in size, dark green colour. Vigorous growing. Matures from seed 7 weeks on.

Zucchini Bush: a good all-rounder for zucchini and marrow production. Bush habit. Cylindrical, straight and slender with slight ridges. Dark green at zucchini stage turning black-green at full maturity. Flesh is greenish-white, firm and fine quality. Matures in 8 weeks, marrows 17 weeks.



Melons – rock and water
Sow: late spring and summer
Sow at depth: 2cm
Plant space: 1.5m
Row space: 1.5m
Germination: 4–14 days at 20–30°C
Maturity: various

Melons are a favourite summer treat and a good source of Vitamin C. They cannot be started until late spring when the soil temperature is consistently warm.

They require a very light, free-draining soil and warm temperatures. Plant on

raised mounds to which has been added plenty of organic matter as compost or peat together with 200g (4 handfuls) of Gro-Plus General Garden fertiliser.

Three seeds can be sown direct in each mound. Alternatively, raise seed in peat pots.

Water regularly during dry periods. Do not over-water in heavy soils or as the fruit approaches maturity. When the vines are one and a half metres long, pinch out the end to promote laterals. As melons mature the ground spot turns from a light straw colour to a rich yellow. Ripe rock melons will slip from the vine and water melons will change in sound when tapped.

Rock melons are very susceptible to powdery mildew and downy mildew, and anthracnose can attack watermelons. Control with Saprol and Bravo.

White fly and aphids can be controlled with Target. Mites may be a problem during hot dry weather, spray with Mite Killer.

To avoid various soil diseases, rotate crops so that melons are not grown in the same area more than 1 year in 3. Ideally, follow root crops.

Varieties are:

Watermelon

Cannonball: a large, round melon. Skin is dark blue-green. The flesh is pink, crisp, and sweet. Matures 12–14 weeks from seed.

Early Yates: a quick maturing, small fruiting variety. Skin is dark green with veining. Flesh is bright red and of fine quality. Matures in 12–14 weeks from seed.

Family Fun: a high yielding and uniform quality hybrid watermelon. Excellent eating. Oblong fruit. Rind is thick and tough. Medium green with dark green stripes. Flesh is vivid red and very sweet. Matures from seed in 12–13 weeks.

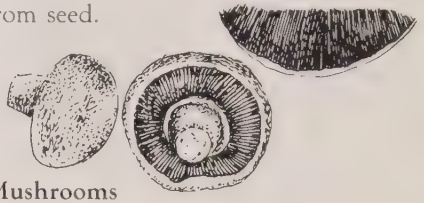
Sugar Baby: an early maturing, popular variety producing small, round fruit. Rind is thin, hard, and dark green with distinct veining. Flesh is very sweet, crisp and bright red. Matures in 12–14 weeks from seed.

Sugar Icecream: a popular oblong fruit. Tough grey-green skin with thick rind. Flesh is deep pink, sweet and very crisp. Does not sunburn easily. Quite resistant to fusarium wilt and anthracnose. Matures in 12–15 weeks from seed.

Rockmelon

Dixie Jumbo: a high-yielding hybrid. Salmon-coloured flesh, firm and very sweet. Rind tough and light tan with a green tinge. Good disease tolerance to powdery and downy mildew. Matures in 13–14 weeks from seed.

Hales Best: has oval fruits. Rind is yellow-green, slightly ribbed and heavily netted. Thick salmon, orange flesh. Sweet aromatic flavour. Matures in 14 weeks from seed.



Mushrooms

Growing mushrooms is particularly rewarding. They are a fungus, and the flower or fruiting stage is the edible portion. Success depends on a good compost, moisture, humidity and temperature control.

The most common mushroom composts are made from baled straw mixed with poultry manure. The poultry manure should form 5–10% of the compost. Soak the bale of straw first, tease out and mix in the poultry manure. The mixture must be damp but not soggy. Turn the compost every two days and do not allow to dry out or get overwet. After about 2 weeks when the compost is heated and has started to cool it can be placed in the bed. Mushroom beds are usually 20cm deep and can be in open ground or a container. When the temperature of the compost has fallen to 24°C the spores can be spread over the area. The mycelium (small threads) should be visible after 2–3 weeks. Top the bed off with 2–3cm of potting mix and firm down.

Mushrooms should appear in 6–10 weeks and will continue to crop over 2–3 months. Mushrooms grow best at temperatures between 16–22°C with a moist atmosphere. The bed must not be

allowed to dry out.

Mushroom beds are best under cover as excess rain will give unfavourable conditions. Keep all fungicides, detergents and cleansers away from beds as they will harm the mushroom fungus. If slaters are a problem, control by sprinkling Diazinon granules over the surface of the bed.

Mushrooms are a good source of niacin, riboflavin and an excellent source of potassium. Once picked, they will only keep for a few days in the refrigerator. They can be eaten raw, baked or stir-fried.



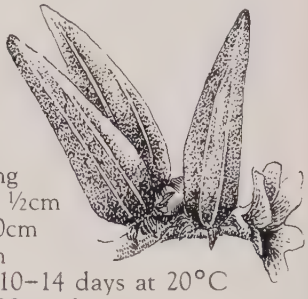
Mustard
Sow: all year
Sow at depth: 1cm
Plant space: 1–2cm
Row space: 10–15cm
Germination: 4–5 days at 20–30°C
Maturity: 6 weeks

Mustard is a tasty addition to salads, sandwiches and garnishes. For cultivation, see the entry for cress.



New Zealand Spinach
Sow: spring
Sow at depth: 1–2cm
Plant space: 50cm
Row space: 80cm
Germination: 7–21 days at 10–15°C
Maturity: 8 weeks onwards

New Zealand spinach is a leafy vegetable with characteristic bright green triangular leaves. It is the only vegetable species native to New Zealand. It flourishes in dry summers when it is too hot for true spinach and has become popular throughout the world. It is a succulent plant which spreads over an area of about 1 metre. Although it is frost tender it often re-establishes itself during the next spring. Growth is rapid and plants respond best to light, fertile soils in sunny positions with adequate moisture. The seeds are tough, so should be soaked for 1–2 hours prior to sowing to help germination. Sow seed direct in soil 2cm deep and thin to 50cm apart after emergence. Harvest by picking about 8cm of the growing tip. This will encourage new shoots to develop. Can be picked over a long period. New Zealand spinach is a little coarse in texture for use in salads, but it cooks well and can be treated in the same manner as true spinach.



Okra
Sow: late spring
Sow at depth: ½cm
Plant space: 50cm
Row space: 1m
Germination: 10–14 days at 20°C
Maturity: 16–20 weeks

Okra is an annual plant suited to warm temperate climates. Plants grow 90cm tall and have large, hibiscus-yellow flowers which form edible pods 7–10cm long. Sow seed direct into garden soil or raise in trays of seed-raising mix, transplanting 6 weeks later. Cultivation is similar to that of capsicums. The pods are ready to pick 4–5 days after the flowers have opened. They are used fresh or dried to flavour soups and stews. Okra combines well with other vegetables, particularly tomatoes.



Onions
Sow: autumn, winter and early spring
Sow at depth: 1cm

Plant space: 2–5cm
Row space: 15–20cm
Germination: 10–14 days at 15–30°C
Maturity: various

Onions are the most universally grown vegetable in the world, being used in virtually every country. They are rich in phosphorus, natural sugars, sulphur and vitamin C. Onions grow well on most soils. They can be sown in seed trays and transplanted out or sown direct into the garden soil in drills and later thinned.

Always use a new packet of seed, as germination deteriorates quickly once the foil sachet is opened. Prior to planting work generous quantities of compost or peat together with 200g (4 handfuls) per square metre of Gro-Plus General Garden fertiliser into the soil. If transplanting do not plant too deeply. Insert only the roots and cut the tops back to 10cm to reduce transplanting shock.

Thinnings can be used as salad or 'spring' onions. A steady moisture supply is essential as the bulb is forming. A side dressing of nitrogen as the bulbs begin to form is beneficial, or alternatively feed with Lush. Weeds are likely to be a problem and will have to be removed by hand between the plants and by shallow cultivation between the roots.

Onions are attacked by several pests and diseases. Aphids and thrips are the most common and are controlled by spraying with Target. Downy mildew causes stunting, yellowing and wilting and is prevalent mainly in warm wet weather. Severe cases may show the grey-brown mould. Prevent by spraying with Bravo or Copper Oxychloride.

Onions are ready to harvest when the tops dry and fall over. After pulling the onions leave them in the sun for a few days to cure. When outside skin is quite dry screw off tops and rub off remaining roots. Select sound, clean bulbs for storage and keep them in a dry, well ventilated area.

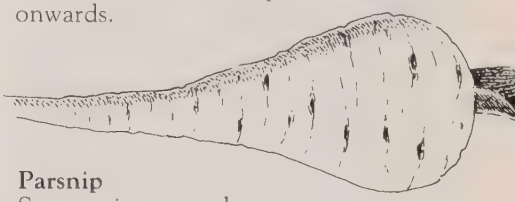
Spring onions are grown in the same way as bulbous onions but harvesting is done at an earlier stage of growth and the plants can be placed closer together.

Varieties are:

Californian Red: an early variety with burgundy skin. Vigorous growing. Odourless and fresh tasting. Popular salad variety. Medium-sized thick, flat bulbs. Medium storage. Matures in midsummer.

Pukekohe Long Keeper: the best main crop variety. Golden brown skin colour. Medium, globe-shaped onion. Flesh firm and pungent. Long-keeping, up to 10 months. Matures in late summer.

White Lisbon Spring: the most popular spring bunching type. Very good quality with wide adaptability. Long white stems. Dark green delicate leaves. Thick, long white pungent shanks. Ideal for salad and savoury dishes. Simple and easy to grow, maturing 13–14 weeks from seed. Harvest from pencil thickness onwards.



Parsnip

Sow: spring to early autumn
Sow at depth: 1cm
Plant space: 10cm
Row space: 30–45cm
Germination: 21–25 days at 15–25°C
Maturity: 19–21 weeks

Parsnips like carrots yield well for the space they occupy. They can also be grown in both cool and warm areas, and can even be left in the ground all winter which, at temperatures near freezing, will improve their sweetness by converting starch to sugar.

Parsnips require a deep, well-prepared free-draining soil. In poorly drained or heavy soil, raise the bed at least 15cm above the surrounding soil. Work in a base application of 200g (4 handfuls) per square metre of Gro-Plus General Garden fertiliser. Avoid the use of fresh manure or compost as it is likely to cause distortion and forking of roots.

Use fresh packets of seed, as the germination deteriorates quickly once the foil sachet is opened. Sow seed directly in the soil 1cm deep in rows 30cm apart. Make sure the seed bed does not become too wet or waterlogged after sowing. Bait the area with Blitzem or Mesurol pellets

to avoid slug damage. When the seedlings are 5cm high, thin out to 10cm between plants. Pull roots as required.

The major pest of parsnips is the carrot rust fly, particularly with summer-sown crops. This can be controlled by applying Diazinon granules to the soil at sowing time and again when the crop is half grown. Rotate crops so parsnips (and carrots) are not grown in the same area more than one year in three. Powdery mildew may be a problem but can be controlled by spraying with Saprol or Benlate.

Varieties are:

Hollow Crown: an old favourite. Hollow-crowned tops with the root curving down to a point. Creamy skin. Matures in 21 weeks from seed.

Freshman: has long, clean tender roots of even shape. Smooth skin. No crown, broad rounded shoulders. Matures in approximately 20 weeks from seed.

Yatesnip: a popular, heavy yielding variety. Large, well-filled evenly tapered roots. No crown and almost square shoulders. Skin very smooth and white. Matures in 19 weeks from seed.



Peas
Sow: autumn and spring
Sow at depth: 2–3cm
Plant space: 20cm
Row space: various
Germination: 7–10 days at 15–20°C
Maturity: various

Peas are still amongst the most popular vegetables fresh from the garden. They are an excellent source of fibre as well as protein and iron.

Peas are a cool weather crop, being sown in early spring and again in autumn for winter cropping. They can be grown in all climates providing they are planted to avoid flowering in frosty weather or hot dry conditions. Peas require a deep, well prepared soil with plenty of added organic matter such as compost or peat. Good drainage is important as they are susceptible to many soil and root diseases. Prior to sowing work in 200g (4 handfuls) per square metre of Gro-Plus General Garden fertiliser.

Dwarf varieties can be sown in a band 20cm wide so that as they grow they support themselves. Taller varieties are best sown in a single row with a suitable staking or support structure. The emerging seedlings may require netting for bird protection and Blitzem or Mesurol to protect against slugs and snails.

Harvest peas when young and tender and just filling the pods. Pick every 2–3 days to prolong flowering.

Peas suffer from many pests and diseases. Aphids are the most common pest and are best controlled by spraying with Orthene. Aphids can also be responsible for the transmission of virus diseases which severely affect peas causing yellowing, stunting and distortion of the vine.

Downy mildew is controlled by spraying with Bravo. Bacterial disease can be severe in wet seasons. To avoid various soil diseases, rotate crops and do not plant in the same area more than 1 year in 3.

Varieties are:

Alderman: a tall, late season variety with wide climatic adaptation. Requires staking. Foliage mid-green colour. Quite resistant to fusarium wilt. Pods straight and pointed.

Greenfeast: a main crop suited to a range of climates. Uniform, very sweet shelled peas. Pods curved and pointed. Foliage medium-green. Quite resistant to fusarium wilt, mosaic viruses. Suitable for freezing.

Novella: a self-supporting pea, producing high yields of very sweet and tender peas. When the plants are close together, the mass of tendrils (which replace the leaves) interlock, and neighbouring plants thus support each other. Grows to 80cm high. Does not require staking. Sow late winter/spring. Matures early, 9 weeks

from sowing seed.

Onward: an old established garden pea. Mid-season main crop. Sturdy growing and ideal for cooler districts. Pods long straight and blunt, foliage pale green. Quite resistant to fusarium wilt and mosaic.

Sugar Snap: these peas are unique in that the pod and peas can be eaten as both are sweet and flavoursome. Prolific, tall and requires staking.

Victory Freezer: a main crop. Vigorous in all districts. Pods straight and blunt. Foliage medium-green. Suitable for freezing. Quite resistant to fusarium wilt.

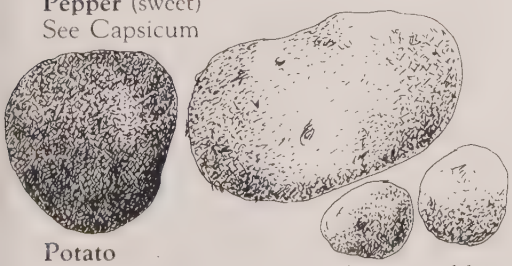
W.F. Massey: a quick maturing variety. Hardy reliable and grows well in colder districts. The peas are sweet. Ideal for freezing. Matures in approximately 9 weeks from seed.

Sugar Daddy: a stringless sugar snap with a dwarfing vine that does not require staking. They mature 10–11 weeks after sowing. Pea and pod are sweet, juicy and full of flavour.

Snowflake: a snow pea with large flat pods. They are picked for tenderness when very young just as the peas start to swell. The pod and the pea are both eaten. The pods have no tough inner skin and fit the little peas closely. In Australia, they are known as Snow Pea, in France as *Mangetout* or 'eat it all'.

Snowflake has bright green pods with a delicate, sweet juicy flavour. This particular variety holds its sweetness and flavour over a longer period than other Snow Peas trialled in New Zealand and is resistant to powdery mildew. Matures in 10 weeks from seed, when the pods are 10cm long by 15mm wide. The vines do not require staking.

Pepper (sweet)
See Capsicum



Potato

Potatoes are the most popular vegetable in the western world and part of our staple diet. While they take up a lot of room in the garden, the yield is rewarding. Early varieties when harvested fresh from the garden have a superb flavour and are particularly worthwhile.

Potatoes are a warm season crop and susceptible to frost. In cold districts planting is restricted to spring and early summer while in warm districts they are grown virtually all year round. Potatoes are grown from tubers commonly known as seed potatoes. However, as potatoes suffer from several virus diseases which can be carried over in the seed potato, it is recommended that only Government certified seed potatoes be used. This assures seed of a high standard with purity and freedom from virus disease, and therefore a much greater chance of producing a good crop. Pre-start potatoes by placing tubers in a warm, sunny position for a week or two before planting. This allows the young sprouts to develop.

At planting time, cultivate the soil thoroughly and if possible incorporate plenty of compost and a general garden fertiliser. Plant tubers 5cm deep, 30–50cm apart in rows 60–80cm apart. Take care not to damage the sprouts on the tubers. As the sprouts emerge, mound up the soil so that a ridge is formed up the stem of the potato. This has a number of advantages: it encourages development of roots from the base; protects the young shoots from frost, protects the tubers from the potato tuber moth and helps to control weeds.

Variation in the growth rate with wet and dry weather is the biggest factor affecting the quality and cooking performance of potatoes. Keep the soil moist, particularly at flowering time. Early potatoes are ready 3 months after planting and when the flowers are fully opened. Carefully remove the soil to examine. If the tubers are the size of eggs, they are ready for harvesting. Early potatoes should be eaten immediately as their soft skins are not suitable for storage. Main crop varieties should be left, until the stalks and foliage have completely dried off. If the skin of the potato can be rubbed off with the thumb they are not sufficiently mature to store.

Pests and diseases can be a major problem with potatoes. The main disease is late blight which (despite its name) attacks early in the season when conditions are wet, or alternatively late in the season when autumn rains occur. If these blight conditions prevail, spray with Bravo. Several soil diseases can also attack potatoes, the most common being verticillium. This disease causes darkened patches on the new potatoes which eventually lead to rotting. It is apparent in the tops by causing a blackening of the stems. Under adverse conditions or a high incidence in the soil together with wet weather the tops of the potato are likely to collapse and die quickly.

Rotate crops so potatoes are not planted in same area more than 1 year in 3. This will also help avoid nematode infestation.

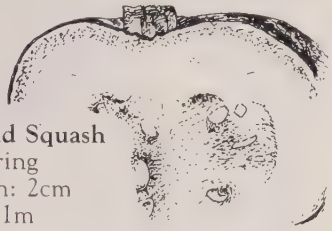
The major pests of potatoes are aphids and potato tuber moth, both of which are controlled by spraying with Orthene. Avoid leaving the tubers exposed from the soil prior to digging and do not leave tubers out overnight after they have been dug. If potatoes are to be stored they should be thoroughly dried after harvesting and stored in sacks and placed in a cool, dry, dark area with good ventilation. For long-term storage tubers can be kept in a firmer condition by dusting the inside of the sack (before filling) with No Sprout. This stops the tuber from sprouting and reduces dehydration and shrinkage.

Potatoes are rich in Vitamin C and B and have more protein and iron than most other vegetables. They also contain the minerals phosphorous, potassium and calcium. They should be cooked in the

POTATOES			
Variety	Maturity	Best soil type	Tuber description
Arran Banner	Early	Light to medium soils	Round irregular shape. Cream skin, white flesh. Medium to deep eyes.
Cliffs Kidney	Early	Medium to heavy soils. Requires warm conditions.	Kidney-shaped, slightly pink skin. White flesh.
Ilam Hardy	Early/maincrop	Most soils.	Oval to round shape. Cream skin and white flesh.
Maris Anchor	Maincrop	Suited to most soils but needs to be irrigated on light soils.	Oval shape. White skin and flesh. Shallow eyes.
Sebago	Maincrop	Light to medium soils.	Oval to round shape. Fine white skin and flesh. Shallow eyes.
Rua	Maincrop	Most soils	Oval shape. White skin and flesh. Excellent keeper.
Iwa	Maincrop	Most soils. Needs moisture.	Oval shape. White skin and flesh. Excellent early quality.
Tahi	Late maincrop	Most soils.	Round flat shape. White skin and flesh. Shallow eyes.

skin to avoid loss of nutrients.

Selecting the correct variety is most important. Some produce large watery tubers in wet regions while others crop poorly in light soils. Below is a description of those varieties more commonly available. 'Maincrop' is a term indicating a potato harvested in the middle of the season.



Pumpkin and Squash
Sow: late spring
Sow at depth: 2cm
Plant space: 1m
Row space: 3m
Germination: 5–10 days at 20–30°C
Maturity: various

Pumpkins and squashes come in a range of shapes, sizes, colour and texture. Squashes are quicker maturing, not quite so hardy and do not store as well as pumpkins, but their requirements are similar. Both are high in dietary fibre and a good source of Vitamin A. Pumpkins and squashes are a warm weather crop with most varieties needing 4–5 months of warm, frost-free conditions. The main requirements are a warm, sunny spot sheltered from wind, an abundance of moisture and nutrients and plenty of space to spread. It is not uncommon for one plant to send tendrils out over distances of 6–8 metres.

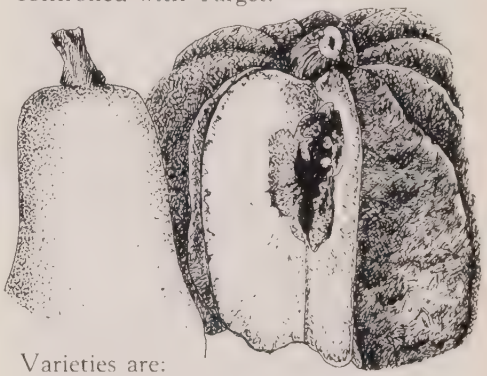
They are best grown on mounds which should be prepared by working in organic matter such as compost or peat together with 200g (4 handfuls) of Gro-Plus General Garden fertiliser. Seed should not be sown until the soil temperature is at least 15°C. (In areas with a short summer time can be saved by sowing the seed in peat pots indoors and transplanting outdoors in early summer.) Plant 3–4 seeds 2cm deep in each mound. After germination remove the weaker plants leaving the two strongest plants per mound.

For large pumpkins, leave only three fruits on each plant, removing the remainder from the outer length of the vine.

Pumpkins and squashes are mature when the vines shrivel and the stem turns brown and easily detaches from the vine. Harvesting should take place before the first frost. Store pumpkins in a dry, well ventilated place. Storage can be improved by dipping the fruit in a solution of Copper Oxychloride or Benlate.

The major disease affecting pumpkin is powdery mildew which appears on both upper and lower surfaces of the leaves in warmer weather. This can be controlled by spraying with Saprol or Benlate. Downy mildew, which causes a rotting of flowers and fruit, a yellowing of leaves and produces a greyish mould on the undersides of leaves only, can be prevalent in warm wet periods. Control with Bravo. Rotate crops so pumpkins and squashes are not grown in the same area more than 1 year in 3. Ideally, follow a root crop.

Whitefly is usually the only major insect attacking pumpkins and can be controlled with Target.



Varieties are:
Pumpkin

Tristar: a cross between Triamble and Queensland Blue. Distinctive 3-lobed shape. Medium to large fruit. Rind is thick, tough, and a deep shiny blue-grey. Firm deep orange to red flesh, very sweet and dry. Small seed cavity. Matures in 20–23 weeks from seed

Triamble: an older, popular variety. Distinctive 3-lobed shape. Large fruit. Rind is thick, very tough and slate grey in colour. Flesh is a deep orange and sweet. Good keeper. Matures in 21–24 weeks from seed.

Queensland Blue: large, flat and ribbed. Firm, deep orange flesh. Rind is thick, hard and a blue-grey colour. Very

good storage. Matures from seed in 20–23 weeks.

Whangaparaoa Crown: most favoured of all for long-keeping winter pumpkin. Flat, round shape. Rind is thin, pale grey and slightly corrugated. Flesh is solid, deep orange, dry and sweet. Small seed cavity. Matures from seed in 20–22 weeks.



Squash

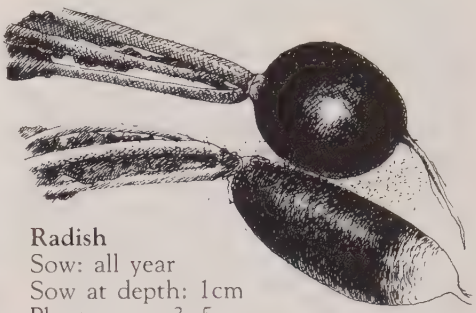
Buttercup: finest quality summer and autumn squash. Early maturing with small fruit. Superb flavour. Ideal family-sized fruit. The flesh is firm, deep orange, sweet and dry. Very uniform shape and size. Rind is dark green with pale green flecks and stripes. Trailing habit. Not recommended for long-term keeping (maximum storage of 2 months). Matures from seed in 14–15 weeks.

Buttercup Bush: a bush type of Buttercup. Compact habit. Sweet and dry flavour with fine-grained orange flesh. Has excellent eating qualities. Not recommended for long-keeping. Matures in 14–15 weeks from seed.

Butternut: a favourite, small fruited squash. Delicate nutty flavour. Distinctive, buff-coloured, pear-shaped fruits. Rind is thin, hard and very smooth. The flesh is chunky and has small seed cavity. Trailing habit. Medium storage. Matures in 15–17 weeks from seed.

Golden Hubbard: a large, early maturing orange squash. Round shape slightly tapered at both ends. Rind is thick and deeply warted, orange with light tan stripes. Flesh is orange, dry and quite sweet. Large seed cavity. Trailing habit. Good storage. Matures in 15–17 weeks from seed.

Red Warren: an older red-skinned variety. Flat and round tapered sides. Rind thick, warted and deep scarlet orange. Firm, thick orange flesh with large seed cavity. Trailing habit. Matures from seed in 17–19 weeks.



Radish
Sow: all year
Sow at depth: 1cm
Plant space: 3–5cm
Row space: 15–30cm
Germination: 4–8 days at 15–30°C
Maturity: 4 weeks

Most gardeners begin their gardening experience with radishes. They are fast to germinate, easy to grow, and mature quickly. However to get crisp, mild, non-pithy radishes, regular watering and good nutrition are very important. They are a cool weather crop growing fast in spring and autumn. Fertilisers should be worked into the soil before planting so that the nutrients are quickly available. Alternatively, liquid-fertilise with Lush. The soil should be well prepared with compost or peat worked in together with 200g (4 handfuls) per square metre of Gro-Plus General Garden fertiliser. Sow seeds direct in the garden soil in rows or drills. Thin out to 3–5cm apart after emergence.

For a continuous supply of crisp radishes, repeat sowings every 10 days. Radishes must be grown quickly and not allowed to over-mature. Pick roots early before they get old and tough.

The only major pests in early spring are slugs and snails. Lay bait to protect seedlings.

To avoid clubroot, rotate crops so that radishes and members of the brassica (cabbage) family are not grown in the same area more than 1 year in 3.

Varieties are:

French Breakfast: a rose scarlet variety with white tips and oblong, blunt shape. Short tops. Matures from seed in 4 weeks.

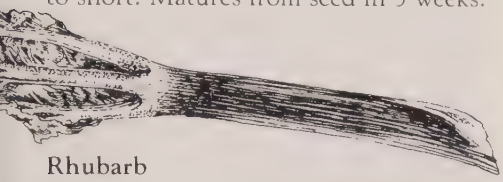
Long Scarlet: deep scarlet with tapering roots, 15cm long. Crisp and

tender with a mild flavour. White flesh. Medium tops. Matures from seed in 5 weeks.

Red Devil: with a small, round, bright scarlet root. Quick growing, uniform, tender and mild. White flesh. Short tops. Prefers cooler conditions. Matures from seed in 4 weeks.

Stoplight: with a globe shape, and solid, cherry-red colour. Flesh white and crisp and mild. Short tops. Matures from seed in 4 weeks.

White Icicle: an older variety but still very popular. Root is 12–15cm long, tapering and slender. The flesh is white, firm, tender and mild. Tops are medium to short. Matures from seed in 5 weeks.



Rhubarb

Rhubarb is one of the few perennial vegetables and apart from harvesting should be left undisturbed for 3–4 years.

It is adapted to all climates and a variety of soils but needs good drainage, regular watering and generous feeding. It can be grown in sun or shade.

Rhubarb can be raised from seed, but results are variable. The most common way of establishing rhubarb is to divide established crowns in late winter or early spring. Space plants 1m apart. Each winter, loosen soil around plants and fork in compost and Gro-Plus General Garden fertiliser.

Remove flowering stems if they appear, and apply Lush to encourage more leaves and stalks. Pick stalks, using outside ones first, as required. Do not use leaves as they contain poisonous quantities of oxalic acid.

Rockmelon

See Melon



Salsify (Vegetable Oyster)

Sow: spring and summer
Sow at depth: 1cm
Plant space: 10cm
Row space: 45cm
Germination: 21–25 days at 15–25°C
Maturity: 20–22 weeks

Salsify is grown for its cream-coloured roots, which have a delicate oyster flavour when baked or fried. For New Zealanders it is a vegetable with a difference, and it is easy to grow and adapted to all climates. Its cultivation is the same as for carrots and parsnips.

Scallopini

See under Marrow.



Shallots

They are amongst the oldest vegetables, and have been in cultivation for many centuries. Although very closely related to the onion, the shallot in its manner of growth is quite different. It is a plant that seldom produces seed and has a profusion of leaves. The bulbs, when planted, quickly divide into great numbers of cloves which remain attached to a common disc.

The flavour of shallots is quite distinctive – something like a mild onion with a touch of garlic. They are highly prized and are excellent as a substitute for onions, being the preferred ingredient in many recipes. The bulbs are used as seasoning and give a more delicate flavour than most onions. The leaves can also be cut when they are green and used in a similar manner to chives.

Shallots are planted through the winter in a well drained soil in a sunny situation. The soil should be well prepared by adding compost or peat and working in 200g (4 handfuls) per square metre of Gro-Plus General Garden fertiliser prior to planting. Shallots should be divided into single bulbs immediately before planting, each bulb being firmly pressed into the prepared soil – just enough to enable it to hold its position, leaving the top half exposed. Space 10cm apart with

25cm between each row. Each bulb planted will produce between 6 and 12 new bulbs.

As they begin to ripen, scrape the soil away from the clusters to allow the light to help mature them to firm healthy shallots.

They are harvested when the leaves have withered back to the neck of the bulbs in midsummer. They should be stored in net bags or tied in strings in a cool airy place. Well cured shallots will keep for 9 months.



Spinach
Sow: winter
Sow at depth: 1–2cm
Plant space: 20cm
Row space: 45cm
Germination: 7–21 days at 10–15°C
Maturity: 7 weeks

Spinach is a cool-season, short-day crop which tends to run to seed in warm weather and when the days are long.

Sow seeds direct into garden soil which has been prepared with organic matter and fertiliser. Water regularly. When plants are large enough, pick outside leaves individually as required or harvest whole plant.

Varieties are:

Dutch Queen: a hardy, long-standing, broad-leaf variety suitable for all seasons in cooler districts. A good winter spinach. Prickly-seeded, vigorous and upright plant. Leaves large and lightly crumpled. Medium green colour. Matures from seed in 7 weeks.

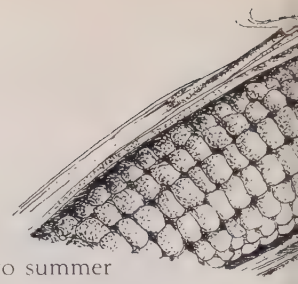
Royal Denmark: with broad, rounded, almost smooth dark green leaves. Large, spreading semi-upright plant. Matures from seed in 7 weeks.

Spinola: a hybrid spinach which produces vigorous, succulent, savoy and oval shaped leaves. Upright plants. Quick-maturing in 6 weeks from weeks.

See also New Zealand Spinach.

Spring Onion
See Onion

Squash
See Pumpkin



Sweetcorn
Sow: late spring to summer
Sow at depth: 4cm
Plant space: 20cm
Row space: 60cm
Germination: 8–10 days at 22–30°C
Maturity: 11–16 weeks

Sweetcorn is a popular and easy-to-grow summer vegetable which will grow on a range of soils providing drainage is good. Prepare soil well, with plenty of organic matter and 200g of Gro-Plus General Garden fertiliser per square metre. Sow seed in pairs 20cm apart. Later thin to 1 plant each 20cm. Successive sowings at 2 weekly intervals will give a continuous supply over the summer.

Corn is wind-pollinated. Plant in short blocks rather than long single rows. If cobs are poorly filled with grains there has been insufficient pollination. Scatter snail bait to protect seedlings from slugs and snails. Netting may be necessary for bird protection. Cultivate between rows to control weeds. The cornear worm, a striped caterpillar, can cause damage to cobs. If necessary, spray after flowering with Orthene.

Water regularly, particularly as the crop matures. As a general guide corn is ready to harvest 3 weeks after the first silk appears, when it becomes brown and dry. Make a further check by pulling open the husk from the top and pressing the grains with the thumbnail. If the grain is soft and juicy it is ready to pick. If overripe the grains are tough and doughy. Pick cobs with a downwards twisting action. Popcorn is different from sweetcorn but is grown in the same way. It is the very high starch content of the grains which makes them explode or pop when heated.

Varieties are:

Golden Cross Bantam: a popular quick-maturing hybrid. Cobs are long, vigorous, and sturdy. Sweet flavour. Matures in 12–13 weeks from seed.

Marcross Express: an early maturing

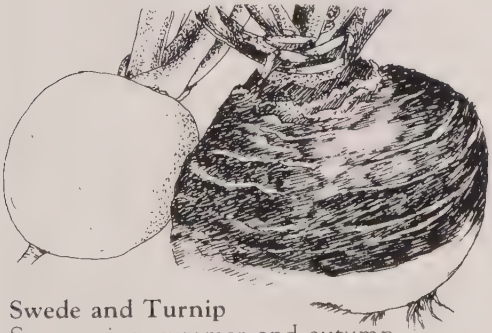
hybrid. Fine-grained yellow cobs. Produces cobs under difficult early season conditions. Plants grow to 170cm high. Matures 11–12 weeks from seed.

Mixed: a select mixture of best quality early and late maturing hybrids. Especially blended for small gardens where repeat sowings for successive picking are not possible. Matures from seed in 11–16 weeks.

Summer Sweet: a juicy, crunchy, hybrid sweetcorn which is vastly superior to other varieties. It is three times as sweet; retains sweetness longer (sugars do not convert to starch); and it retains attractive appearance and holds it colour well.

Summer Sweet can be eaten without cooking and is commonly served raw in salad. If cooked it only requires 1–2 minutes and can be eaten without butter and salt. Summer Sweet holds its freshness up to 14 days after it is picked. If cut, the kernels are distinctly clear or translucent in appearance (normal sweetcorn will have a creamy white texture indicating the presence of starch). Matures in 12 weeks.

Cultural Point: for optimum sweetness cross-pollination of Summer Sweet should be avoided. Plant in isolation from other sweetcorn varieties at least 30m distance apart, or 10 days' difference in the silk emergence. The seed is smaller and more shrivelled than other varieties of sweetcorn due to the higher sugar and lower starch content.



Swede and Turnip
Sow: spring, summer and autumn
Sow at depth: 1cm
Plant space: 7–10cm
Row space: 30cm
Germination: 5–10 days at 15–30°C
Maturity: 12 weeks

Turnips and swedes are often considered together but there are distinct differences in cultivation. Turnips are best grown in spring, summer and autumn. They have rough hairy leaves, are fast growing and become pithy in a short period of time. Swedes are best sown in summer for winter use. They have smooth waxy leaves, mature more slowly and hold over a longer period without deteriorating. Both are sweeter and have a more delicate flavour if they are grown quickly. Both will grow in most soils but for good results work in compost or peat together with 200g (4 handfuls) per square metre of Gro-Plus General Garden fertiliser prior to planting. Sow the seed direct in the garden soil in drills. Successive sowings will give a continuous supply. Water regularly during dry weather. For best flavour, harvest after the first winter frosts.

Pests include aphids, white butterfly, caterpillars, diamond back moth, and white fly, which can all be controlled with Target and Orthene. The major disease is club root. Rotate crops so swedes and turnips and members of the brassica (cabbage) family are not grown in the same area more than 1 year in 3.



Silverbeet
Sow: spring, summer and early autumn
Sow at depth: 1–2cm
Plant space: 20cm
Row space: 40cm
Germination: 6–14 days at 10–30°C
Maturity: 8–10 weeks

Silverbeet is perhaps one of the more versatile vegetables grown, and deserves its popularity. It can be available from the garden for virtually 12 months of the year

in most districts. If fertilised, watered and picked regularly the plants will continue to grow for many months before bolting to seed. Silverbeet is an excellent source of Vitamin A, Vitamin C, calcium, iron and dietary fibre.

Silverbeet is easy to grow. It requires a well prepared, free-draining soil to which has been added compost or peat together with 200g (4 handfuls) per square metre of Gro-Plus General Garden fertiliser worked in thoroughly prior to sowing. Raise in seed trays and later transplant out, or sown direct in the soil in rows or drills. Thin to 20cm apart. A further side dressing of fertiliser at the same rate as above should be applied every 2–3 months. Water regularly in dry weather.

If outer leaves turn yellow or show infestation of rust or fungal spots they should be removed. If rust continues to be a problem spray with Copper Oxychloride.



Tomatoes
Sow: spring and summer
Sow at depth: ½cm
Plant space: 40cm
Row space: 60cm
Germination: 3–14 days at 20–30°C
Maturity: 12–20 weeks

Tomatoes are a very popular home garden vegetable. The plants give a higher yield for the amount of space than any other. They need 3 months of warm, frost-free weather to produce well. Most gardeners start tomatoes with young plants which are available at garden centres from early spring. Alternatively, sow seed 1cm deep in peat pots or seed trays 6 weeks prior to transplanting.

Tomatoes need a warm, sheltered area, particularly early in the season. In early spring when day temperatures are warm but night still falls below 12°C, many varieties will not set fruit. Seed can be sown from spring through to summer. Late plantings will crop through until early winter in mild areas. Tomatoes need a deep, free-draining soil to which organic matter such as compost or peat has been added. Prior to planting work in 200g (4 handfuls) per square metre of Gro-Plus General Garden fertiliser.

Dwarf varieties do not require any training, but with the tall varieties staking and regular pruning of laterals is important. Most standard varieties are best trained to one or two leaders. Vigorous hybrids such as Early Money and Virosa will support 3–5 leaders, while grafted plants will carry 8–10 leaders under good conditions. Other than those chosen for leaders all remaining side shoots or laterals must be pinched out. Remove laterals while quite small to avoid large wounds. Each leader will require its own support or stake. Plants with several leaders are more easily supported and trained on a fence or frame.

When the plants are about 1 metre high, side dress with 100g (2 handfuls) per square metre of fertiliser and repeat at monthly intervals.

Regular watering is important during dry weather to help size up the fruit. Irregular watering is likely to cause blossom end rot, a black rotting patch on the bottom of the fruit.

Poor fruit set can be caused by too much water and nitrogenous fertiliser during early growth; too much shade or dull weather; temperatures below 12°C; high humidity which upsets pollen formation.

Tomatoes are ideal container plants, particularly for gardens with unfavourable or diseased soils or limited space. Quick maturing dwarf varieties such as Patio or Red Alert are ideal. Grow in pots 20–25cm in diameter or in hanging baskets. Tall varieties will thrive in a



10-litre container or planter bag. Growing tomatoes in containers will require extra attention to watering and regular feeding.

Some home gardeners will have glasshouses in which to raise early tomatoes. In an unheated house, planting is done in early spring for cropping in early summer. The area can then be immediately replanted in summer for winter fruit. Outdoor tomatoes will fill the gap between summer and autumn. With a heated glasshouse, planting can be made in autumn for cropping commencing in late winter through to summer when outdoor crops come on. Local experience and preference will involve systems and timing around this.

The major difficulty with growing tomatoes out of season is the lack of light through the winter period. This causes slow soft growth, with a risk of disease and poor fruit set. Through autumn, winter and the early spring period glasshouse tomatoes should be liquid fed with a high potash food to harden the growth. For best results temperatures should be kept above 10°C. In most areas daytime temperatures are adequate but heating is required at night. Ventilation is an important part of glasshouse tomato growing, to avoid diseases and high temperatures on sunny days. The most common disease of glasshouse tomatoes is botrytis which is largely caused by lack of ventilation. Open the house during the day to increase air movement around the crop. Removing old leaves around the base of the plant will also increase air movement. Tomatoes are susceptible to a number of pests and disease. A regular spray programme should be followed as a prevention measure.

Varieties are:

Dwarf

Little Giant: a heavy yielding dwarf hybrid. Large fleshy fruit with excellent flavour.

Floramerica: a bush or short stake

SPRAYING TOMATOES		
Time	Material	Pest/Disease
September/October	Copper Oxychloride	Blight, bacterial speck
November/April	Bravo + Orthene	Early, late blight, leaf mould, botrytis, white fly, tomato fruit worm, caterpillars, aphids

hybrid tomato. Large fruit. Globe shape with smooth scarlet skin. No greenback. Medium/early maturity. Excellent disease resistance.

Patio: a compact hybrid tomato ideal for growing in tubs or troughs. The fruit is medium size, firm, bright red and flavoursome. Does not require staking. Matures early. Quite resistant to fusarium.

Red Alert: a hybrid tomato. Compact bush habit, requiring no training, punching or staking. Just plant and pick. Early fruiting. Approximately 100 fruit per plant. Exceptional flavour with high sugar level. Excellent for patios and pot culture.

Roma: a popular, pear-shaped variety. Heavy yielding. Firm, meaty flesh with excellent flavour. Medium to early maturing. Recommended for hot weather and tropical production. Good preserving variety. Tolerant to fusarium and verticillium wilt disease.

SOLVING PROBLEMS WITH TOMATOES

Symptom	Cause	Remarks
Split fruit	Heavy watering or rain after soil has been dry	Water regularly through dry periods
Blossom drop	Low temperatures in spring or very high temperatures in summer	Grow a variety suited to the season e.g. Early Money for early or late crops
Sun scald – papery brown patches on fruit	Exposure to bright sunlight	Do not remove too many old leaves at once
Blossom end rot – bottom of fruit sunken, leathery and blackened	Lack of calcium, together with irregular watering	Lime, water daily
Blotchy ripening – parts of fruit remain yellow or orange	Too much heat Too little potash	Add potash
Misshapen fruit	Poor pollination caused by cold weather at flowering or very high temperature Also virus diseases	
Rolling of older leaves	Excess deleafing or a wide variation between day and night temperatures	
Yellowing between veins beginning with lower leaves	Magnesium deficiency Can also be nitrogen and potash deficiency	Apply magnesium sulphate plus tomato food
Green back – area around stalk remains hard, green and unripe	Excess sunlight Too dry Too much potash	Apply sulphate of ammonia and water regularly
Insects clustered on young shoots	Aphids	Orthene®
Tiny white insects on underside of leaves which fly when disturbed	White fly	Target®
Small caterpillar tunnel holes in fruit	Tomato fruit worm	Orthene®

Tall

Beefsteak: a popular, large fruiting, bright scarlet variety. Firm and smooth with green shoulders. Does better when grown on stakes. Medium/early maturity. Tolerant to verticillium and fusarium. Sets well under adverse conditions.

Early Money: a very popular early hybrid tomato. Heavy yielding, round, medium-size fruit with even ripening. An excellent early season tomato which sets fruit and matures earlier than other varieties. Quite resistant to verticillium wilt.

Grosse Lisse: a heavy yielding, large fruiting type. Solid, meaty flesh. Vigorous and tall with medium maturity. Quite resistant to fusarium wilt and verticillium.

Moneymaker: a tall, vigorous variety. Medium-sized fruit. Deep globe, no green shoulder.

Potentate: an older tall variety. Fruit is medium to large and globe shaped. Skin is uniform, smooth and ripens

Symptom	Cause	Remarks
Leaves become yellow (mottled) and dehydrated in hot, dry weather especially in glasshouses. Minute insects under leaves.	Mites	Coopers Mite Killer
Irregular green/brown or black patches on leaves spreading rapidly in wet weather	Late blight	Copper Oxychloride/Bravo®
Small spots on older leaves increasing to 1cm. Common in hot humid weather	Early blight	Copper Oxychloride/Bravo®
Leaves, stems and fruit develop a grey/brown rot or mould	Botrytis grey mould	Bravo® and Benlate®
Older leaves showing yellow blotches with grey mould on undersides. Young leaves showing pale circular spots	Leaf mould	Bravo® and Benlate®
Leaves yellow and wilt, followed by total collapse of the plant	Verticillium wilt	Do not grow in same area more than one year in three. Alternatively sterilise soil with Basamid granules
Black specks on leaves usually in early spring or in cool wet weather	Bacterial leaf spot	Copper oxychloride
Leaves pale and stunted, blackening of stems, followed by stunting and death	Bacterial wilt	Destroy plants. If bad, grow future plants in a new area
Plants suddenly stop growing and tops become yellow/purplish and bunched	Spotted wilt virus	Destroy plants

evenly. Suitable glasshouse variety. Medium maturity.

Sweet 100: an unique home garden hybrid which produces enormous yields of very sweet, cherry-sized fruit. Each truss is branched in two and carries between 40–60 fruit. Tall, vigorous and requires staking or a trellis.

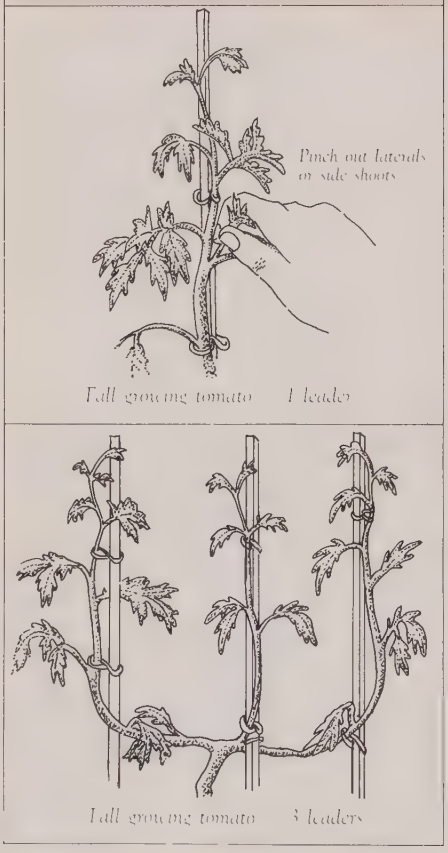
Golden Boy: a yellow-fruited hybrid. Large, round fruit with a mild flavour. Produces high yields over an extended period of time. Tall, requires staking.

Available as seedlings

Virosa: a standard variety, widely grown commercially. Medium-sized, round fruit. Tall, requires staking.

Eurocross: a popular variety. Round fruit with uniform ripening. Tall, requires staking.

TRAINING TOMATOES – trained to 1,3 leaders





Watercress
Watercress is a perennial grown from cuttings. It is a close relative of nasturtium and is found growing in running streams. It can be raised in pots standing in water in the shade. It has a distinctive mild peppery flavour and is popular in salads, sandwiches and as a garnish.

Watermelon
See Melon

Witloof
See Endive



Yams
The yam, also known as oka, is becoming increasingly popular with home gardeners. (Oka should not be confused with the true yam, which is a tropical plant with an edible root.) The tubers are a shiny rose pink or pinky yellow 3–4cm long. They grow best in a warm location, in a well drained fertile soil. Plant tubers in spring 7cm deep, 30cm apart in rows 50cm apart. As they grow, earth up as for potatoes. Harvest in autumn after the first frost when the foliage dies down. In warmer areas they can be left in the ground and harvested as required.

Zucchini
See Marrow

FAVOURITE VEGETABLES









Clockwise from top left: Beetroot (Canner King), Onion (California Red), Potato, Mushroom.

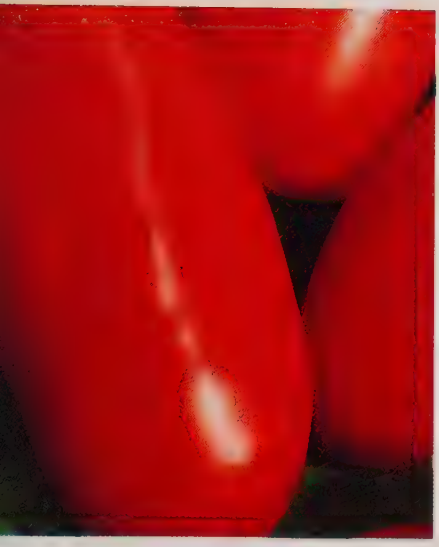
SALADS & ITALIAN COOKING







Clockwise from top left: Cucumber (Burpless), Spring Onion (White Lisbon), Tomato (San Marzano), Florence Fennell (Zefa Fino), Buttercrunch, Endive, Mignonette and Great Lakes Lettuce.











VEGETABLES FOR EXCITING COOKING









Clockwise from top left: Eggplant (Blacknite), Cabbage (Prize Red), Pepper (Yolo Wonder), Cauliflower (Main Crop), Chinese Cabbage (Wong Bok), Courgette (Patty Green Tint), Artichoke (Green Globe), Asparagus (Mary Washingt









PERFECT STONEFRUIT









Clockwise from top left: Plum (Greengage), Plum (Wilson's Early), Peach (Golden Queen). Apricot (Trevatt),

PIP FRUIT & BERRYFRUIT











Clockwise from top left: Pear (Louise Bonne de Jersey), Apple (Red Delicious), Apple (Braeburn), Blackcurrant, Redcurrant.



Dianthus 'Double Pinks'



Zinnia 'Burpee Mixed Hybrids'



Pansy 'Engleman's Giants'

CHAPTER EIGHT

FLOWERS FROM SEED

FLOWERS ARE universally cherished, and most people experience a special satisfaction from seeing a plant sprout from seed they have sown, and knowing it will later produce blooms. Starting flowers from seed is not only exciting, but is also an inexpensive way to create a flower garden, giving a wide selection of plants which can be sown in order to bloom at the times when you want most colour in the garden.

THERE ARE many hundreds of flowering plants on the garden scene in New Zealand. The Yates seed range consists of annuals, biennials and perennials. It includes the latest cultivars and improved strains as well as retaining the popular old world flowers. Descriptions have been compiled from technical reports and personal observations of Yates technical staff and are based on New Zealand conditions. However, the performance of any variety will differ depending on soil types, fertility, moisture, temperature and light intensity encountered during the growing period.

FLOWER AND GARDEN TERMS

Annuals
Annuals are plants that complete their life cycle within one year or less. They are usually planted in the spring, flower through the summer and autumn and die with the first frosts in winter. Annuals are temporary plants but their brief stay is brilliant, making them among the most popular of all plant choices.



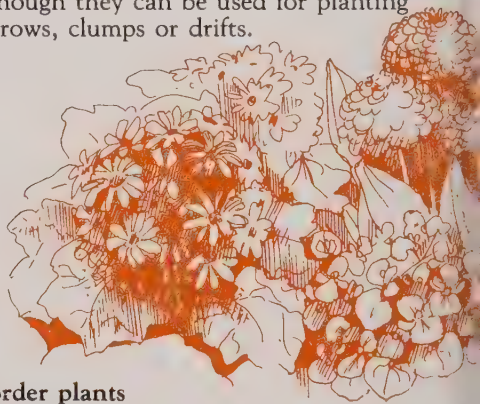
Perennials
Perennials are permanent plants in the garden. The stems and leaves may die back during the winter but the roots remain alive and send out new shoots each spring.



Biennials
Biennials are plants that take two years to complete their life cycle. The first year they grow from seed into a leafy plant, the second year they flower, set seed and die.



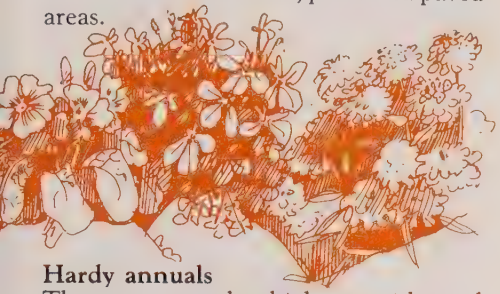
Bedding plants
These are plants best suited to planting in masses in a special bed of their own, although they can be used for planting in rows, clumps or drifts.



Border plants
Borders are long narrow beds and usually contain a variety of plants. Border plants lend themselves to planting with other types of plants.



Edging plants
These are low-growing prostrate and dwarf plants for dividing beds or forming a border between lawns, paths and paved areas.



Hardy annuals
These are annuals which can withstand cold, taking light frost without being damaged.

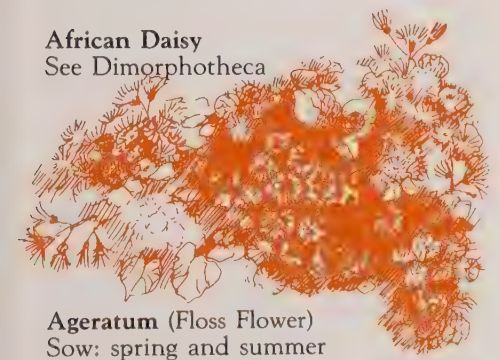
Tender annuals
These are plants that have originated in cold climates and usually need a fairly long warm summer to produce a good display of flowers.

Naturalising
Naturalising means sowing flower seeds where they will grow up looking spontaneous or wild, as though no one had planned their position. Sites particularly suited to this type of planting include areas under trees, alongside water and in informal corners of the garden.

FLOWER VARIETIES

Acrolinium
See Everlasting daisy

African Daisy
See Dimorphotheca



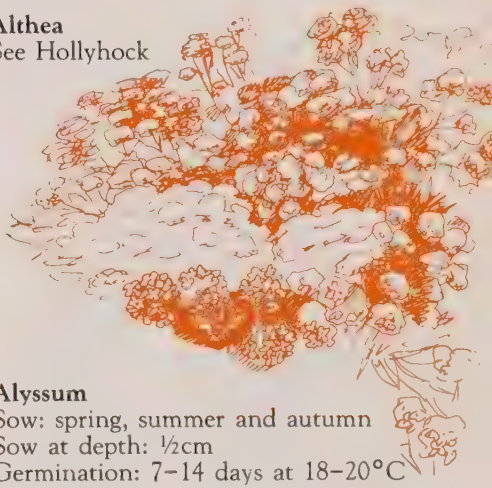
Ageratum (Floss Flower)
Sow: spring and summer
Sow at depth: ½cm
Plant space: 15–20cm
Height: 15–20cm
Germination: 5–10 days at 20–25°C
Flowers in: 14 weeks

Ageratum provides a treasure chest of different shades in the garden, blue having the most dramatic effect. Set close together, the plants can create a carpet of colour. Ageratum needs warm soil before planting, and will not tolerate frost. It is also not very heat resistant. In warm summer climates, spring and autumn crops are planted.

Plant in a rich, moist well drained soil in full sun, although slight shade is tolerated. Raise in trays of seed-raising mix or sow direct outdoors. Do not cover seed, as light is required for germination. Ageratum needs good air circulation. Water regularly and liquid-fertilise at 3–4 weekly intervals with Lush. Remove faded flowers to encourage a compact plant and continuous flowering. Use for edging, bedding, rockeries and containers.

Varieties are:
Blue Mink: a dwarf variety with clusters of soft blue flowers.
Blue Blazer: a blue hybrid available as seedlings. Grows to 15cm high.

Althea
See Hollyhock



Alyssum
Sow: spring, summer and autumn
Sow at depth: ½cm
Germination: 7–14 days at 18–20°C
Plant space: 10cm
Height: 10–20cm
Flowers in: 8 weeks

Alyssum is hardy and easy to grow. It is popular for edging and borders and is ideal for rockeries and wall gardens and flowers all year in most climates. Prefers full sun but tolerates semi shade. Grows

well in all soil types tolerating poor dry soils. Good drainage is essential. Raise in trays of seed-raising mix or direct sow into garden position. Cover seed with mix, firm down and keep moist with fine mist of water. Water plants regularly in dry weather and give regular applications of Lush. Cut back all faded flowers to prolong flowering. Pull out weeds when they are small to prevent damaging the fine roots of alyssum.

Varieties are:

Carpet of Snow: masses of pure white flowers on dwarf plants up to 10cm high.

Rosie O'Day: low trailing, covered with striking rose pink flowers.

Royal Carpet: deep violet flowers. Plants up to 10cm high. Combines well with Carpet of Snow giving a beautiful contrast.

Saxatile: a perennial form of alyssum. Grows to about 15cm with clusters of deep yellow flowers in spring. Ideal for borders, mass plantings and added colour in rockeries.

Amaranthus
See Love Lies Bleeding

Anthirrhinum
See Snapdragon



Aquilegia (Columbine, Granny's Bonnet)
Sow: spring and autumn
Sow at depth: ½cm
Germination: 21–25 days at 20°C
Plant space: 30cm
Height: 60cm
Flowers in: 28 weeks

A delightful, old-fashioned flower with graceful, fernlike foliage. The flowers are long spurred and come in a range of rich colours. They prefer semi-shade but will tolerate full sun in cool summer climates, although the flowering period will be shortened. Thrives in a cool moist soil rich in organic matter. Drainage must be excellent. Water generously and give regular applications of Lush every 2–3 weeks. Plants can be divided in the autumn but in warmer climates it is best to sow seed each year. After flowering, plants should be cut back to encourage another crop.



Aster
Sow: spring and summer
Sow at depth: ½cm
Germination: 10–20 days at 20–25°C
Plant space: 30cm
Height: various
Flowers in: 12 weeks

Familiar for their daisy-like flowers in autumn, in a wide range of rich bright colours. Asters require a light, moist, well-drained soil of average fertility. They can be grown in full sun or partial shade, preferring the latter in hot climates. Water frequently but never allow roots to remain wet. Pinch late spring growth to produce denser plants. Varieties over 80cm will require support to protect them from wind and rain. If rust or powdery mildew is a problem, spray with Saprol.

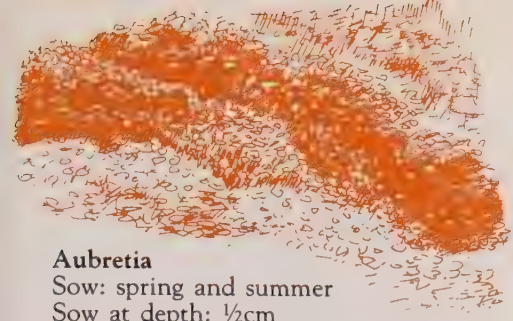
Varieties are:

Crego Giant: a wilt-resistant variety with large double flowers made up of long curled and twisted petals. Flowers come in a full range of colours.

King Aster: a vigorous strain which flowers freely with large fully double blooms, which last well.

Princess Mixed: has a rich, bright colour. An excellent cutting range.

Milady mixed: an outstanding mix, available as seedlings. Bushy habit growing to 25cm.



Aubretia
Sow: spring and summer
Sow at depth: ½cm
Germination: 8–15 days at 15°C
Plant space: 15cm
Height: 5cm
Flowers in: 12 weeks onwards

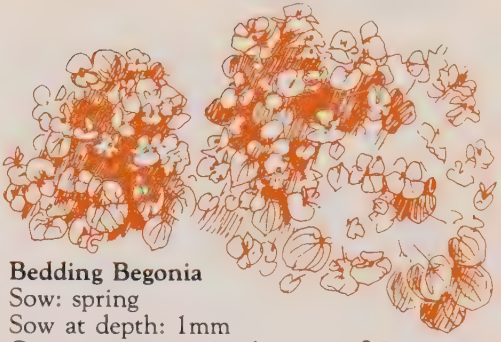
A hardy, trailing, evergreen perennial. Ideal for rock gardens, ground cover, edging, walls and in sunny exposed areas. Raise in trays of seed-raising mix or sow directly into garden position. Cover seed with mix, firm down and keep moist with fine mist of water. Best grown in full sun or partial shade in warm climates. Trim plants after flowering.

Bachelor's Button
See Cornflower



Balsam
Sow: spring and summer
Sow at depth: ½cm
Germination: 7–14 days at 20–25°C
Plant space: 30cm
Height: 50cm
Flowers in: 8 weeks

A colourful perennial excellent for borders and mass display. It can also be grown in window-boxes, pots and tubs. Prefers full sun and tolerates semi-shade. Raise in trays of seed-raising mix or sow directly into garden position. Cover seed with mix, firm down and keep moist with a fine mist of water. Produces a multitude of bright flowers resembling small roses. For best results pinch plants to promote bushier growth. The thinning of some of the leaves may be necessary to display flowers. They prefer a fertile sandy soil rich in organic matter. Liquid-fertilise with Lush, and water regularly.



Bedding Begonia
Sow: spring
Sow at depth: 1mm
Germination: 14–21 days at 20°C
Plant space: 20cm
Height: 15–20cm
Flowers in: 16 weeks

Few other flowers grow so well in shaded areas. They are tolerant of abuse and adaptable to sun or shade. The plants are compact and flower over a long season. They have the dual attraction of both colourful foliage and flowers. Sow the fine seeds as thinly as possible in trays of seed-raising mix. Lightly cover seed with mix, firm down and keep moist with fine mist of water. Plant in a well drained soil with shade or sun. Allow soil to dry out between waterings and fertilise regularly with Liquid Lush.

Varieties are:
Bedding Begonia: special mixture of dwarf types which flower almost continuously all year round in warmer climates. Colourful foliage from maroon to deep crimson is in contrast with the white, pink, scarlet and crimson flowers.

Bellis
See Double Daisy



Bells of Ireland
Sow: spring
Sow at depth: ½cm
Germination: 25–35 days at 10–15°C
Plant space: 30cm
Height: 75cm
Flowers in: 12 weeks

Bells of Ireland produce apple green 'bells' up and down tall stems. Ideal in the flower border, as cut flowers or dried flowers. The flowers' fresh, light green colour is refreshing and when dried they turn a light tan which is ideal for delicate winter arrangements. Grows well in an average garden soil with good drainage in full sun or partial shade. Raise in trays of seed-raising mix or direct sow into garden position. Cover seed with mix, firm down and keep moist with a fine mist of water. Water regularly and feed every 3–4 weeks with Lush. Staking is necessary.



Brachycome (Swan River Daisy)
Sow: spring and summer
Sow at depth: ½cm
Germination: 14–21 days at 15–20°C
Plant space: 20cm
Height: 20–30cm
Flowers in: 16 weeks

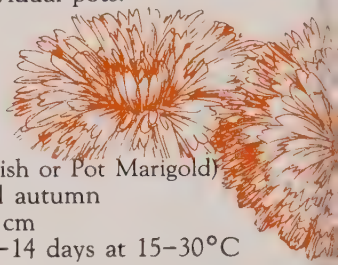
A native of Western Australia, this delightful annual has dainty single flowers in blue, mauve or white. It is useful for low borders and ideal for rockeries or containers. Brachycome will grow on quite poor soil and prefers light, well drained soil in a sunny position. Raise in trays of seed-raising mix or sow direct outdoors. Once the plants are established they need little attention. Do not over-water. Brachycome has a short flowering season. Sow seed at 2–3 week intervals to provide continuous flowering.

Busy Lizzie
See Impatiens



Cacti
Sow: all year
Sow at depth: ½cm
Germination: 4–12 weeks at 15–25°C
Plant space: various

It is interesting to grow a mixture of desert plants. Cacti are usually spiny and leafless, producing massive round, flat or angular growth. They require a well drained soil and a warm sunny position in low humidity. They make ideal container plants for a sunny windowsill, balcony or patio. Easy to grow. Raise in trays of seed-raising mix and prick out into small, individual pots.



Calendula (English or Pot Marigold)
Sow: spring and autumn
Sow at depth: 1cm
Germination: 5–14 days at 15–30°C
Plant Space: 25–30cm
Height: various
Flowers in: 10 weeks

This marigold provides a broad expanse of colour over a long season. The large daisy-like flowers make a colourful winter display and are ideal for cutting. Foliage is an attractive dark green. Hardy, and will withstand several degrees below freezing. Performs well in containers and is suitable for borders, bedding and flowers. Raise in trays of seed-raising mix or sow direct outdoors. It self-sows readily in mild climate and will naturalise in the wild garden. This plant prefers a well drained moist soil in full sun. Performs best in cool weather. Hot conditions may produce small flowers. Spray with Shield to prevent mildew and aphids.

The modern varieties are far superior to the earlier ones and have resulted in calendula's increase in popularity.

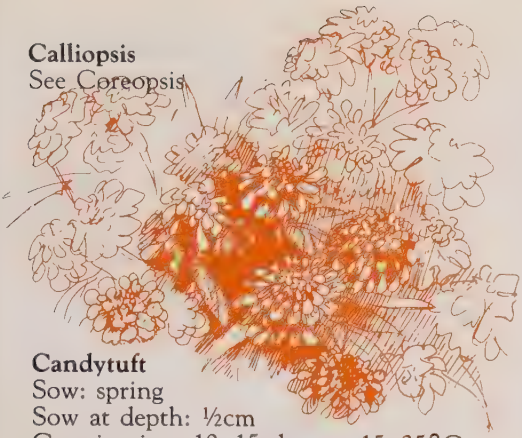
Varieties are:

Pacific Beauty: has soft pastel shades of apricot, yellow, persimmon and orange. Petals are straight and the colours are enhanced by darker tonings on the tips.

Goldmine Mixture: Large double flowers which produce over a long period.

Fiesta: an excellent mix of dwarf plants growing to 30cm, available as seedlings.

Calliopsis
See Coreopsis



Candytuft
Sow: spring
Sow at depth: ½cm
Germination: 10–15 days at 15–25°C
Plant space: 25cm
Height: 25–30cm
Flowers in: 12 weeks

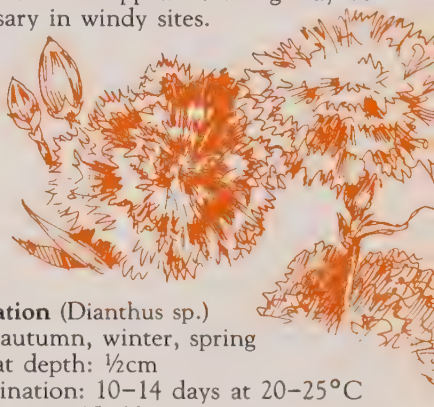
Compact, dome-like plants with mixed flowers in rose, lavender, mauve and white. Ideal for rock gardens, edging, beds, cut flowers and borders. Candytuft grows well in most soils but they must be well drained. The plants prefer a sunny situation sheltered from strong winds. Tolerates drought and heat. Easy to grow and quick maturing. Keep weeds down by shallow cultivation. Liquid-fertilise with Lush as candytuft begins to flower. Cut back faded blooms to prolong flowering.



Canterbury Bells (Campanula)
Sow: spring, summer and autumn
Sow at depth: ½cm
Germination: 14–21 days at 20°C
Plant space: 30cm
Height: 30–80cm
Flowers in: 14 weeks

Canterbury Bells form spires of large 'cup and saucer' flowers with the look of porcelain.

They are perfect for the informal garden where a soft natural look is desired. Ideal for borders, rock gardens and cut flowers. Prefer a rich, moist, well drained soil in full sun, although tolerant of partial shade. Keep soil evenly moist. Colours range from dark blue to mauve, rose, soft pink and white. Raise in trays of seed-raising mix or direct sow into garden position. Cover seed with mix, firm down and keep moist with a fine mist of water. Liquid-fertilise with Lush as flower buds appear. Staking may be necessary in windy sites.



Carnation (Dianthus sp.)
Sow: autumn, winter, spring
Sow at depth: ½cm
Germination: 10–14 days at 20–25°C
Plant space: 15–30cm
Height: 90cm
Flowers in: 20–28 weeks

A favourite and fragrant garden flower. Flowers most of the year in a wide range of colours, the most common being red, pink and white. Suitable for use in borders, beds, edges, rockeries, pot plants and cut flowers.

Prefers light sandy soil with organic matter in a sunny position protected from the wind. Declines under summer heat.

Raise in trays of seed-raising mix or direct sow into garden position. Cover seed with mix, firm down and keep moist with a fine mist of water.

To encourage compact, sturdy plants, pinch back the early flowering stems to induce side shoots. Remove faded flowers to encourage flowering.

Varieties are:

Marguerite Malmaison: a bedding carnation producing a large number of sweetly clove-scented blooms. Easily raised from seed.

Chabaud Giants: lovely, large, double-fringed with a wide range of colours. A hardy, bushy plant, a favourite cut flower because of its spicy fragrance.



Cathedral Bells (Cobaea scandens)
Sow: spring
Sow at depth: 2–3cm
Germination: 15–21 days at 20–25°C
Plant space: 50cm
Height: 3 metres
Flowers in: 14 weeks

A vigorous evergreen climber with glossy leaves. Solitary bell-shaped flowers are green at first and turn purple as they mature. Flowers in spring and summer and in warmer climates throughout the year. Protect from cold wind and keep well watered when flowering. Plant in full sun in rich, well drained soil direct into permanent position in garden. Suitable for use as a vine on a trellis or screen. Clings to brick-type surfaces although support wires are desirable.



Celosia (Cockscomb and Prince of Wales Feather)
Sow: spring
Sow at depth: ½cm
Germination: 10–15 days at 20–25°C
Plant space: 30cm
Height: various
Flowers in: 10–12 weeks

Celosia can be divided into two distinct categories: Prince of Wales Feather, which has vertical feathery flowers that look like a flame; and the crested type or cockscomb which has tightly borne convoluted flowers resembling a rooster's comb. Both make long-lasting and unusual cut flowers and hold their colour well when dried. Use as specimen plant in containers, edgings, borders, cut flowers, dried flowers and bedding plants. Take care sowing the fine seed which is prone to drying out. Sow seed in trays of seed-raising mix. Cover seed with mix, firm down and keep moist with a fine mist of water.

Plant in a well drained soil high in organic matter. Tolerates poor dry soil and revels in a hot sunny situation. Plants are susceptible to frost. Water plants regularly, especially in hot weather, and feed Lush as flowering commences. Destroy weeds by shallow cultivation to avoid damaging surface roots.

Varieties are:

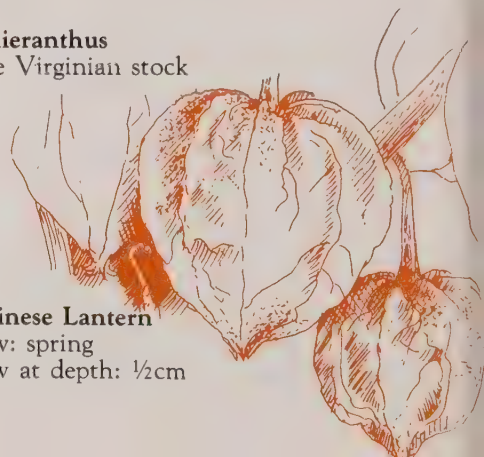
Golden Feather: a dwarf variety grown to 30cm with golden yellow plumes in a pyramid shape. Free flowering and an ideal companion for the red Forest Fire.

Painted Ostrich: produces a wealth of crimson, scarlet and gold plumes, growing to 45cm.

Forest Fire: the dazzling scarlet red of this variety makes a sparkling display. The large uniform plumes are suitable for cut flowers.

Glasgow Select (Cockscomb): giant crested blooms in crimson, yellow, salmon and gold. Flowers last 6–10 weeks. Grows to 45cm.

Chieranthus
See Virginian stock



Chinese Lantern
Sow: spring
Sow at depth: ½cm

Germination: 20–25 days at 20–25°C
Plant space: 30–45cm
Height: 1m
Flowers in: 16 weeks

A spectacular perennial (a relative of the Cape Gooseberry), with scarlet lantern-shaped seed capsules. Makes a most attractive dried decoration. Easy to grow.

Sow seed in trays of seed-raising mix. Cover seed with mix, firm down and keep moist with fine mist of water. Transplant when 7–10cm tall.



Chrysanthemum (Annual)
Sow: spring
Sow at depth: 1cm
Germination: 10–18 days at 20°C
Plant space: 15cm
Height: 60cm
Flowers in: 16–20 weeks

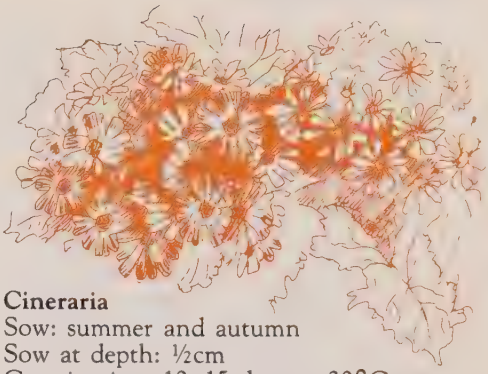
A large, well known and versatile group of plants. The annual Chrysanthemums are commonly grown from seed. They prefer a mild, moist climate, declining in hot dry summers. They grow well in a variety of soils, preferring those with plenty of organic matter and of good fertility. Plant in a warm, sunny position and avoid shady, windy sites.

Water regularly until plants are established.

Fertilise with Lush as flower buds begin to form. Remove faded flowers to prolong flowering. If aphids are a problem, spray with Orthene.

Suitable for use in beds, borders and as cut flowers.

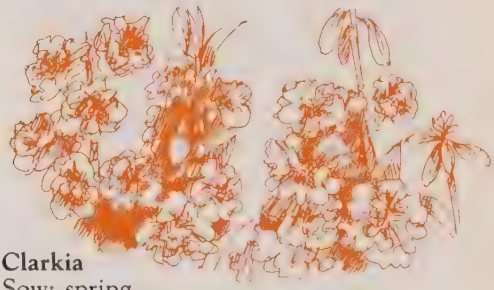
A good variety is **Korean Rainbow**, the finest of the small flower annual varieties with double and semi-double flowers in profusion. They come in an array of reds, pinks yellows and pastels.



Cineraria
Sow: summer and autumn
Sow at depth: ½cm
Germination: 10–15 days at 20°C
Plant space: 30cm
Height: 20cm
Flowers in: 20 weeks

Cinerarias are among the garden plants which prefer shade. The flowers in winter and early spring come in a wide variety of colours. Take care in sowing the fine seed. Sow seed in trays of seed-raising mix. Cover seed with mix, firm down and keep moist with a fine mist of water. Self-seeds readily after flowering.

Feed regularly every 2–3 weeks with Lush, especially towards flowering time. Spray with Orthene to control aphids and leaf miners.



Clarkia
Sow: spring
Sow at depth: ½cm
Germination: 5–7 days at 20°C
Plant space: 30cm
Height: 60cm
Flowers in: 14–12 weeks

An easily grown annual with funnel-shaped flowers resembling peach blossoms. They are ideal for bedding plants, pots, containers, rock gardens and as cut flowers. Perform best in areas where the summers are dry and cool, where they flower from summer to frost.

Sow seed directly in garden in early spring, barely covering the fine seeds.

Tolerates poor dry soil but must have excellent drainage preferably in a light and sandy soil. Plant in full sun or light shade. Cut as first 2–3 flowers open on stem.

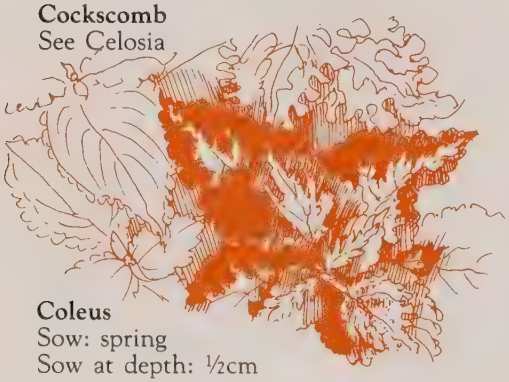


Cleome (Spider flower)
Sow: spring
Sow at depth: ½cm
Germination: 14–21 days at 20–30°C
Plant space: 50–60cm
Height: 90cm
Flowers in: 12 weeks

An unusual shrubby annual growing to a height of 1–2 metres. The flowers are pink, lilac, mauve or white with long spidery stamens. The tight clean foliage, showy flowers and undemanding nature make it an excellent choice for the rear of the border. The slightest breeze keeps the graceful plants in motion. Most effective when massed in groups in large beds for dramatic, durable beauty. A long-lasting cut flower.

Sow seed outdoors in spring and indoors 4–6 weeks prior to planting out. Raise in trays of seed-raising mix or direct sow into garden position. Cover with mix, firm down and keep moist with a fine mist of water. Adapts to a range of soils. Plant in full sun. Withstands heat and drought well. Keep well watered.

Cockscomb
See Celosia



Coleus
Sow: spring
Sow at depth: ½cm
Germination: 10–14 days at 20–25°C
Plant space: 30cm
Height: 15–90cm
Flowers in: 8 weeks

Coleus offers an incredible range of foliage colours, shapes and sizes. Leaves can be velvety or rough and crinkled, notched or rounded. They are easy and versatile to grow in sun or shade, inside the house as a houseplant or outside as a tender annual.

Prefers cool, filtered shade with plenty of moisture. Pinch flowers as they form and prune stems to keep plants low and dense. Keep well watered and spray with Orthene to protect from insects. Liquid feeding with Lush at 7–10 day intervals promotes large leaves and intensified colours.

Columbine
See Aquilegia



Coreopsis (Calliopsis)
Sow: autumn and spring
Sow at depth: 1cm
Germination: 7–10 days at 20–25°C
Plant space: 60cm
Height: 70cm
Flowers in: 12 weeks

Flowers all summer, providing a mass of colour on wispy stems. Suitable for growing in borders, edging, bedding, cut flowers and naturalising. Best in a light sandy soil in full sun but tolerates a range of conditions. Water moderately. Taller varieties may need staking. Remove faded blooms to prolong flowering



Cornflower (Bachelor's Button)
Sow: autumn to early spring
Sow at depth: ½cm

Germination: 7–14 days at 18°C
Plant space: 30cm
Height: 60cm
Flowers in: 10 weeks

An old-fashioned favourite for early summer flowering. Hardy and easy to grow. Suitable for beds, borders and cut flowers. Sow outdoors in early spring or inside 4 weeks prior to transplanting. Prefers a rich, moist soil but will tolerate poor soil and drought. Plant in full sun. Water moderately. Taller varieties may need staking. Successive plantings will help extend flowering although it will decline in hot weather. Spray regularly with Saprol to prevent rust.

Varieties are:

Double Mixed: early double flowers of blue, pink and white.

Blue King: shaded blue.

Pink Julep: a mixture of frosty pinks, white and red shades.

Red Boy: a double red flower with silvery foliage.



Cosmos
Sow: spring and summer
Sow at depth: ½cm
Germination: 7–10 days at 20–25°C
Plant space: 40cm
Height: 1m
Flowers in: 10 weeks

Tall, colourful plants with richly coloured daisy-like flowers on delicate airy stems. Sow directly outdoors in permanent place in spring or 5–7 weeks prior to transplanting indoors in containers. Prefers dry soils with good drainage. Plant in full sun and avoid exposure to wind. Avoid overwatering. May need staking. Cosmos are easy plants to grow and need little attention. The modern varieties are vastly superior in flower form and colour range to the older types.



Cyclamen
Sow: spring
Sow at depth: ½cm
Germination: 21–28 days at 12–15°C
Plant space: 15cm
Height: 20–30cm
Flowers in: 50–75 weeks

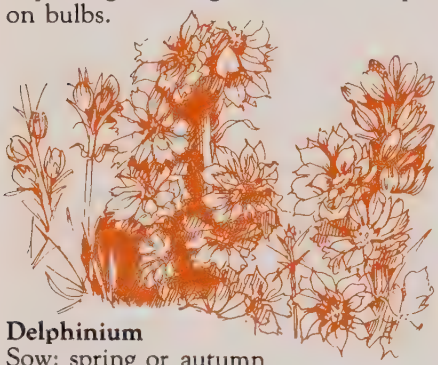
Popular for winter and early spring flowering. The dark green, marbled, heart-shaped leaves, often with silver markings, are an added attraction. Most take 18 months to flower from seed. Sow seed in trays of seed-raising mix. Cover seed with mix, firm down and keep moist with fine mist of water. Cover seeds well as they require darkness to germinate. They can be grown in a semi shaded position in the garden, but are more often grown in pots and containers. They do well indoors but need a well lit, well ventilated draught-free spot. The plants form a tuber that can be carried on from year to year. However if more than 2–3 years old they are best replaced with new plants grown from seed.



Dahlia
Sow: spring
Sow at depth: ½cm
Germination: 5–14 days at 20°C

Plant space: 50–100cm
Height: 50cm
Flowers in: 14 weeks

Popular plants for late summer and autumn flowering. They are easy to grow and produce a mass of flowers for many weeks. Dahlias can be grown from seed or tubers. There is always interest in growing them from seed because of the possibility of obtaining unusual variations in colour and flowers. Tubers of the best plants can be saved for replanting next year. Sow seed in trays of seed-raising mix. Cover seed with mix, firm down and keep moist with fine mist of water. Dahlias prefer a sunny position sheltered from the wind. They require a well drained soil with an open structure. Keep well watered and feed with Lush at 2–3 weekly intervals. Pick flowers as they fade to prolong flowering. See also the chapter on bulbs.



Delphinium
Sow: spring or autumn
Sow at depth: ½cm
Germination: 12–30 days at 12–15°C
Plant space: 50cm
Height: 1m
Flowers in: 20 weeks

Delphiniums are famous for their tall, bold spikes in rich blues. Their effect can be quite dramatic. Delphiniums are usually short-lived, often being treated as biennial or as a short lived perennial. They require a rich, moist, well drained soil high in organic matter. Plant in full sun and give good air circulation. They are natives to the cool mountain meadows of Europe and in regions with hot humid summers will decline rapidly.

Seed germination is often slow. Sow seed in trays of seed-raising mix. Cover seed with mix, firm down and keep moist with a fine mist of water.

Fertilise with Gro-Plus General Garden fertiliser in early spring and again later during growing season. Water abundantly but never let the soil remain soggy. Staking is necessary to prevent the heavy spikes from breaking in the wind and the shallow rooted plants from dislodging in the soil. Cultivate around the roots gently. As flowers fade, snip off the spike just below the lowest flower.

Spray with Shield at 10-day intervals to protect from fungus and insect pests. Remove and destroy all infected plants and do not replant in the same area if disease has been a problem.

During summer months a mulch of peat or compost around the roots will help retain soil moisture and keep the roots cool.

Pacific Giant: is a magnificent tall hybrid variety. The giant flower spikes are closely packed with satin textured flowers in colours which range from white, pink, lavender, blue, pale blue, mid-blue and royal blue to purple.



Dianthus (Pinks)
Sow: spring
Sow at depth: 1cm
Germination: 5–10 days at 21°C
Plant space: 15cm
Height: 40cm
Flowers in: 20 weeks

A close relative of the carnation, with similar cultivation requirements. The plants are adapted to a wide range of soils and they tolerate dry conditions. They make excellent rockery and edging plants and produce masses of fragrant flowers in reds, mauves, pinks and white.

Dianthus is usually treated as an annual but if cut back after the first

flowering and given adequate water it will flower again in the second year. Best in well drained alkaline soils, in sun or semi-shade. Declines under summer heat.

Varieties are:

Double Pinks: a mixture of plain and fringed flowering pinks. Colour range is from deep red to maroon to light shades of pink and cream.

Peppermint Pinks: a selection of the best fragrant pinks, in singles, doubles, fringed and round edges. A contrast of deep colours, dainty pastels and sparkling two-tones. Compact and easily grown with a long flowering season.



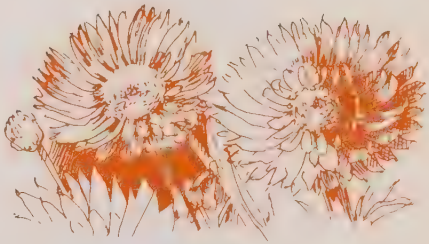
Dimorphotheca (African Daisy, Star of the Veldt)
Sow: spring and summer
Sow at depth: ½cm
Germination: 10–15 days at 15–20°C
Plant space: 30cm
Height: 10–20cm
Flowers in: 12 weeks

Daisy-like flowers in white, yellow, salmon and pink with contrasting dark centres. Used in beds and borders and in large sweeps as a ground cover. Also good as cut flowers but flowers close up at night and on cloudy days. Withstands drought well but prefers cool summers. Do not over-water. Ideally grown in areas with a long, mild, dry summer in an open position in sandy soil.



Double Daisy (Bellis)
Sow: spring and autumn
Sow at depth: ½cm
Germination: 10–15 days at 20°C
Plant space: 15cm
Height: 15cm
Flowers in: 10 weeks

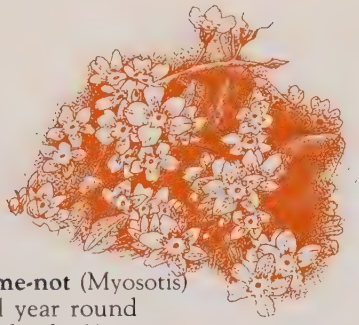
Quick growing and hardy. Although perennials, these daisies are best treated as annuals with fresh seed sown each autumn. They prefer open sunlight or semi-shade and are adaptable to a wide range of soils. Water frequently during dry weather. Cultivate frequently to keep weeds down so the small plants are not choked. As the first flowerbuds appear, fertilise with Lush. Cut faded flowers regularly to prolong flowering. Suitable as a bedding plant, border, rock garden and edging plant.



Everlasting Daisy (Acrolinium)
Sow: spring
Sow at depth: ½cm
Germination: 14–20 days at 20–30°C
Plant space: 45cm
Height: 30–60cm
Flowers in: 14 weeks

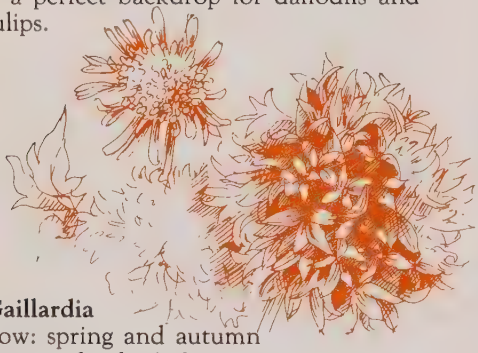
Quick-growing, hardy natives of Australia. They grow on a wide range of soils but need good drainage and an open sunny position. The straw textured flowers are often dried and used for indoor decoration as they retain their shape and colour for many months. Easy to grow, they require little attention apart from regular watering and shallow cultivation to control weeds. Sow seed in trays of seed-raising mix. Cover seed with mix, firm down and keep moist with a fine mist of water. As flowerbuds start to form apply Lush. If flowers are required for indoor decoration cut them just before fully open, tie in bunches and hang upside down in a dry area until stems are dry.

Floss Flower
See Ageratum



Forget-me-not (Myosotis)
Sow: all year round
Sow at depth: ½cm
Germination: 7–14 days at 10–20°C
Plant space: 20cm
Height: 30cm
Flowers in: 12 weeks

An old-time favourite due to its dainty unpretentious charm. Easy to grow. Popular flowers for edging, borders and water and rock gardens. Although the flowers are traditionally blue, there are also pink and white varieties. Forget-me-nots reseed abundantly and will perform year after year. They are natives to the moist rich woodlands of Europe where they flower early in spring just as leaves emerge from the trees. They thrive happily when naturalised in moist conditions in light shade and will tolerate full sun. Water and liquid-fertilise with Lush regularly. The blue haze they form is a perfect backdrop for daffodils and tulips.



Gaillardia
Sow: spring and autumn
Sow at depth: 1–2cm
Germination: 10–15 days at 20°C
Plant space: 25cm
Height: 40cm
Flowers in: 12 weeks

An annual, producing a mass of yellow and red ball-shaped flowers. Ideal to mix with other plants in rustic natural settings. Hardy and easy to grow. Ideal for borders, containers, cut flowers and bedding plants. Raise in trays of seed raising mix or sow directly into garden position. Cover seed with mix, firm down and keep moist with a fine mist of water. Prefers a light well drained sandy soil, will not tolerate heavy clay. Plant in full sun. Will tolerate heat and drought. Do not over-water. Remove faded blooms to prolong flowering. Applications of Saprol may be necessary in areas of high humidity to prevent powdery mildew.



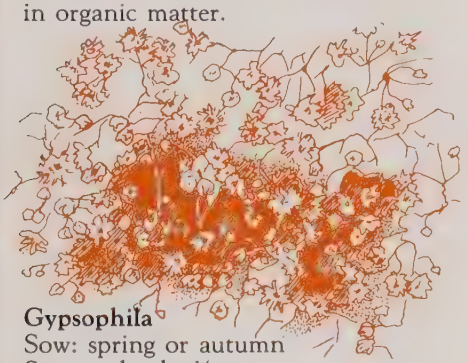
Gerbera (Transvaal Daisy)
Sow: spring
Sow at depth: ½cm
Germination: 7–20 days at 20–25°C
Plant space: 20cm
Height: 60cm
Flowers in: 30–50 weeks

A tender perennial which is sometimes grown as an annual. The dainty flowers come in a wide range from brilliant colours to soft pastels and are excellent for cutting. Gerberas are naturally adapted to dry, sunny conditions and light, sandy soils. They will grow on heavier soils provided they are well drained and have plenty of additional organic matter. Sow in early spring for summer flowering. For best results, sow seed in trays of seed-raising mix. Place the sharp end of the seed down but do not cover, as germination requires light. Prefers long warm summers and high humidity. Keep moist but never soggy and fertilise regularly with Lush. When transplanting set the plants in the ground so that the crown is level with the soil. Grow in the same position for 2–3 years. Older plants can be divided and replanted. Crown rot is a common cause of failure and the plants are often short-lived.



Gloriosa Daisy (Rudbeckia)
Sow: spring
Sow at depth: ½cm
Germination: 5–10 days at 20–25°C
Plant space: 30cm
Height: 1m
Flowers in: 12 weeks

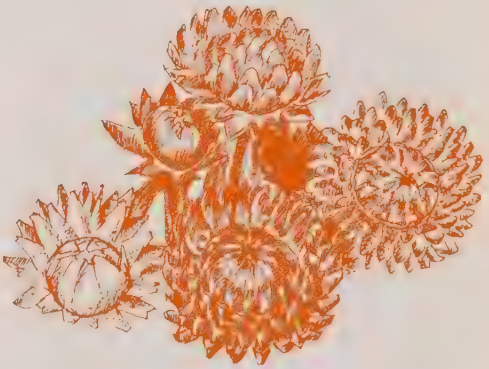
A short-lived perennial, treated as an annual with rugged flowers and foliage. Flowers well the first year from seed. Survives poor soil if well drained and will flower well in the most intense summer heat. The flowers are long-lasting when cut. Suitable for use in borders, bedding, background and cut flowers. Flower colours are bronze, orange, mahogany or wine-coloured. Raise in trays of seed-raising mix or sow directly into garden position. Cover seed with mix, firm down and keep moist with a fine mist of water. Plant in rich, moist, well drained soil high in organic matter.



Gypsophila
Sow: spring or autumn
Sow at depth: ½cm
Germination: 10–15 days at 20°C
Plant space: 50cm
Height: 75cm
Flowers in: 50 weeks

Delightful, delicate, lacy flowers ideal for wild clumps in the garden, rock gardens, rock walls, borders, cut and dried flowers. Sow seed in trays of seed-raising mix. Cover seed with mix, firm down and keep moist with a fine mist of water. Grows well in a drained, limed soil in full sun. Will not tolerate heavy soggy soils. Do not over-water. Flowers in spring and summer. Tall plants may need support. The plant is long lived in a favourable location. Named cultivars are often superior and are generally grafted onto a root stock and can be purchased from nurseries and garden centres.

Helianthus
See Sunflower



Helichrysum (Strawflower)
Sow: spring
Sow at depth: 1cm
Germination: 7–10 days at 21°C
Plant space: 30cm
Height: 75cm
Flowers in: 16 weeks

An Australian native and popular 'everlasting' flower. The paper-textured flowers are in white, gold, mauve and pink and red. Easy to grow and tolerates a range of conditions better than most garden annuals. Grows best in a light, well drained moist soil which is slightly alkaline. Raise in trays of seed-raising mix or sow directly into garden position. Cover seed with mix, firm down and keep moist with a fine mist of water. Plant in full sun. Appreciates long, hot summers. Water only moderately. Plants will need support. To dry, cut flowers at the main stem just before the centre petals open. Tie in small bunches and hang upside down in a dark, well ventilated place.



Hollyhock (Althea)
Sow: summer, autumn
Sow at depth: ½cm
Germination: 10–24 days at 21°C
Plant space: 40cm
Height: 2–3m
Flowers in: 28 weeks

An old English biennial favourite producing beautiful, saucer-shaped flowers on stately stems. One of the tallest flowers in the garden. Sow seed in trays of seed-raising mix or sow directly into garden position. Chipping the hard seed coat may hasten germination. Cover seed with mix, firm down and keep moist with fine mist of water. Prefers full sun in a well sheltered position. Plant will require staking or a trellis for support. Water and liquid-fertilise with Lush regularly. Suitable in the rear of a border and as a background screen.



Honesty (Lunaria)
Sow: spring
Sow at depth: 1cm
Germination: 7–21 days at 15–30°C
Plant space: 20cm
Height: 75cm
Flowers in: 12 weeks

A biennial plant usually grown as an annual. The decorative seed pods are prized for dried flower arrangements and mature in midsummer. The lavender or purple flowers in spring are rather insignificant. Raise in trays of seed-raising mix or sow directly into garden position. Cover seed with mix, firm down and keep moist with a fine mist of water. Plants do best in a cool, partially shaded position in the garden. Liquid-fertilise with Lush as flowering approaches. Cut stems when pods are ripe and allow them to dry by hanging in a well ventilated place. When completely dry, peel off the outside of the pod to reveal the silvery, transparent lining.

Ice plant
See Livingstone Daisy



Iceland Poppy (Papaver sp.)
Sow: summer-autumn
Sow at depth: ½cm
Germination: 10–15 days at 12°C
Plant space: 30cm
Height: 60cm
Flowers in: 20 weeks

A perennial often treated as an annual or biennial. Popular for late winter and spring flowering, making magnificent bedding plants. Brilliant petals are like crinkled silk. Tiny silken hairs cover the buds and long stems and glisten in the sun.

The seeds are exceptionally fine and should be mixed with sand, sown thinly and pressed into the surface of the seed-raising mix. Prick out the delicate seedlings when they are quite small and space 3–4cm apart in containers. Grow them to a good size, hardening them off before transplanting. Keep the crown of the plant slightly above the surface to avoid crown rot. Keep well watered until established. Plant in a fertile, well drained

CARPET OF FLOWERS



Clockwise from top left: Poor Man's Orchid (Grandiflora mixed), Nemesia (Dwarf globe), Alyssum (Rosie O'Day), Lobelia (Crystal Palace)

OLD ENGLISH GARDENS











Clockwise from top left: Delphinium (Pacific Giants), Canterbury Be
Brachycome (Swan River Daisy), Forget-Me-Not (Myosotis), Cornflower (Blue Kit











k (Trysomic Early Mixed), Snapdragon (Intermediate Mixed),
sophila (Fairy Bouquet), Virginian Stock, Night Scented Stock

COTTAGE GARDEN









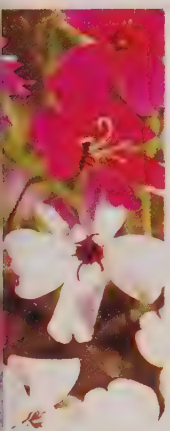


Clockwise from top left: Columbine (Aguilegia
Salpiglossis (Emperor Royal Mixed), Linaria (Fairy Bouque











ıe (Pink Queen), Bells of Ireland, Wallflower (Paris Market),
ria (Mixed), Cosmos (Yates Sensation Mixed), Linium

SUNSHINE COLOURS









Clockwise from top left: Nasturtium (Gleam Hybrids Mixed
Livingstone Daisy, Poppy – Iceland (Colorama Giants), Portulaca (Double Mixed













dula (Flame Beauty), Gloriosa Daisy, Gerbera (Mixed Hybrids),
ırysum (Dwarf Double), Pansy (Roggli Swiss Giants), Marigold (Cupid Mixed)

TALL BORDER & CLIMBING FLOWERS



Clockwise from top left: Sweet Pea (Seventh Heaven), Hollyhock (Charter's Doubles), Morning Glory (Heavenly Blue), Cathedrals Bells

soil rich in organic matter, in full sun. Performs well in regions with cool summers. Suitable for use in borders, rock gardens and as cut flowers. Feed with Lush when flower buds appear. Pinch out early buds until the plants have formed good clumps. Remove spent blooms to prolong flowering.

For indoor decoration pick flowers early in the morning in full bud or at bud opening stage. Dip the stems into boiling water for 30 seconds.

Varieties are:

Sunbeam Mix: with long stems and large blooms. Colours include orange, lemon, and tangerine.

Bright Lights: a much improved new strain with a wide colour range. Large flowers on strong sturdy stems with winter hardiness.

Queen Shirley: large double flowers with many picotee edges. Colours include salmon, rose, pink and red.

Ipomoea
See Morning glory



Impatiens (Busy Lizzie)
Sow: spring
Sow at depth: ½cm
Germination: 14–21 days at 20–25°C
Plant space: 30cm
Height: 50cm
Flowers in: 12 weeks

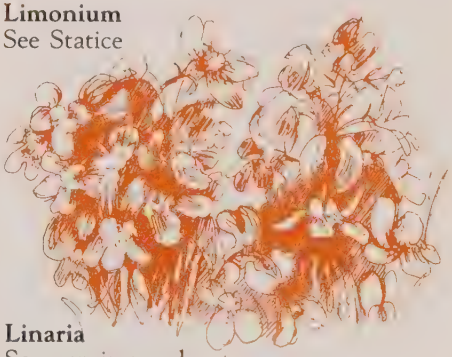
An excellent perennial for moist shady areas, which does well when grown in the open garden or pots, troughs, window boxes and hanging baskets. It will also perform well in the sun in moist coastal areas provided it is watered adequately. Sow seed in trays of seed-raising mix. Cover seed with mix, firm down and keep moist with a fine mist of water. Plant in a well drained sandy soil high in organic matter. Keep soil moist, and liquid-fertilise with Lush at regular intervals. Pinch young plants to promote dense growth. Quick-growing.



Larkspur
Sow: spring and autumn
Sow at depth: ½cm
Germination: 8–15 days at 20–25°C
Plant space: 30cm
Height: 1–2m
Flowers in: 20 weeks

Tall, spring-flowering annuals with the same stately beauty and elegance as the perennial delphinium but easier to grow and with a longer flowering season. The tall, bold spikes are covered with flowers of blue, white, pink and yellow. They decline rapidly in hot summers and prefer a cool, lightly shaded position and a well drained soil. Raise in trays of seed-raising mix or direct sow into garden position. Cover seed with mix, firm down and keep moist with a fine mist of water. Protect from wind. Staking may be necessary. Keep well watered but avoid getting moisture on the foliage. Liquid-fertilise with Lush regularly. Remove spent blooms to encourage longer flowering. Use in beds, borders, as cut flowers and dried flowers.

Limonium
See Statice



Linaria
Sow: spring and autumn

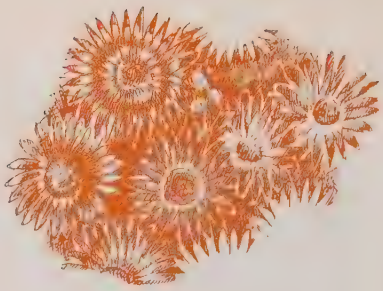
Sow at depth: ½cm
Germination: 7–14 days at 10–15°C
Plant space: 15cm
Height: 20cm
Flowers in: 10 weeks

An adaptable, colourful annual for flowering in winter and spring. The flowers resemble miniature snapdragons and bloom over a long period. Colours range from rose, yellow, pink and lavender to white and salmon. Plant in beds or as edging. Self-sows readily and will naturalise in random patches throughout the rock garden. Sow outdoors in early spring, or start indoors 4–6 weeks prior to transplanting. Raise in trays of seed-raising mix or sow directly into garden position. Cover seed with mix, firm down and keep moist with a fine mist of water. Prefers a loose sandy soil with good drainage rich in organic matter, in full sun. Performs best in areas with cool summer nights or as a spring flower in warmer climates. Water moderately. Will respond to feeding with Lush. Exceptionally easy to grow.



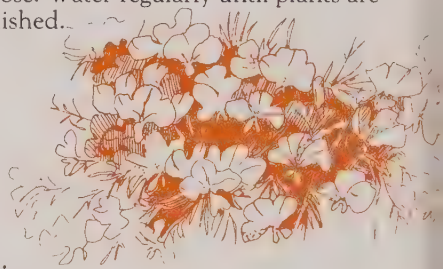
Linum (Scarlet Flax)
Sow: spring
Sow at depth: ½cm
Germination: 10 days at 20–30°C
Plant space: 30cm
Height: 45cm
Flowers in: 12 weeks

A dainty, colourful plant giving an abundance of crimson flowers. An average garden soil is suitable. A sunny position is preferred and ample moisture is necessary during dry weather. Suitable for use in borders, rock gardens and arrangements.



Livingstone Daisy (Mesembryanthemum, Ice Plant)
Sow: spring or late summer
Sow at depth: ½cm
Germination: 15–20 days at 20–25°C
Plant space: 20cm
Height: 10cm
Flowers in: 20 weeks

A low, spreading succulent which produces a carpet of fairy-like flowers in late winter and spring. These dwarf plants make a very colourful sight. Grown as annuals, the tightly packed flowers in yellow, pink, cerise and purple are ideal for carpeting, edging and rockeries. Raise in trays of seed-raising mix, firm down and keep moist with a fine mist of water. The plants are adaptable to light or heavy soil and will stand dry conditions, but need good drainage. They must be grown in full sun. In shade or on cloudy days the flowers will close. Water regularly until plants are established.



Lobelia
Sow: autumn, early winter
Sow at depth: ½cm
Germination: 14–21 days at 20–25°C
Plant space: 10cm
Height: 15cm
Flowers in: 6–8 weeks

A dwarf, spring-flowering plant, excellent for mass colour in edging, rockeries and windowboxes. Grown as an annual, lobelia provides some of the most intense, vivid blues in the garden. The low, dense, trailing plants are smothered with flowers

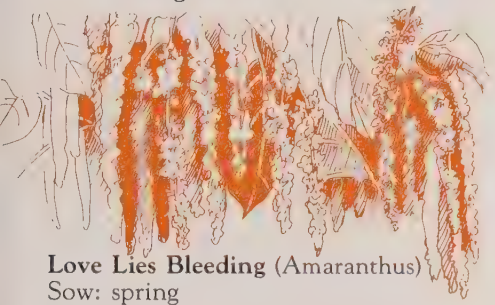
over a long season. They are also suitable for containers, where their soft climbing hides the harsh edges of the container. Best in fertile sandy soil high in organic matter. Plant in full sun or partial shade. Does not withstand heat well. Keep soil moist. Cut back after first flowering to encourage more. Very quick-growing.

Varieties are:

Crystal Palace: has rich dark blue flowers and bronzy foliage.

Mrs Gilbran: a free-flowering compact plant covered with small dark blue flowers with white eyes.

Cambridge Blue: has soft blue flowers.



Love Lies Bleeding (Amaranthus)
Sow: spring
Sow at depth: ½cm
Germination: 14–21 days at 20–25°C
Plant space: 30cm
Height: 50cm
Flowers in: 14 weeks

A popular annual grown for its long, drooping spikes of blood-red flowers in autumn. Grown as a garden plant, houseplant or cut flower. Sow seed directly in soil for best results, as transplanting is difficult. Tolerant to a range of soils. Prefers full sun. Tolerates heat and drought well.

Lunaria
See Honesty



Lupin
Sow: autumn
Sow at depth: 1cm
Germination: 4–5 weeks at 24–28°C
Plant space: 50cm
Height: 1m
Flowers in: 11–30 weeks.

Flowers in spring and early summer with huge spiky racemes of flowers in a range of colours. Most suited to areas with cool summers and humid climates. Tolerates a range of soils. When buds appear, liquid-fertilise with Lush to promote quality flowers over a longer time. Pick faded blooms regularly to promote flowering. Russell lupin is a perennial and in cold districts will last 4–5 years.



Marigold
Sow: spring and autumn
Sow at depth: 1cm
Germination: 6–7 days at 20–25°C
Plant space: 30cm
Height: various
Flowers in: 8 weeks

Marigolds are summer flowering annuals that are grown in early spring or early summer. African marigolds are tall, with larger flowers than the French marigolds which are short and compact. They have either single or double flowers in familiar yellows, golds and orange. Some are bi-coloured with red or brown stripes. Marigolds provide brilliant and easy colour for the garden. Raise in trays of seed-raising mix, firm down and keep moist with a fine mist of water. Prefer moist and well drained soil but will tolerate dry conditions. Intense summer heat may cause marigolds to stall or temporary decline in flowering. While appreciative of rich soil they can produce too much foliage at the expense of flowers if over-fertilised. Dead-heading helps

improve appearance and encourage more flowers. Taller plants will need staking. Rugged and rough. Easy to grow requiring the minimum of attention.

Varieties are:
African Marigolds

Crackerjack: has huge double flowers in deep golds to light primrose, carried well clear of foliage.

Mediterranean Moon: has large double blooms in bright gold and orange with tightly packed ruffled petals. Flowers come early and are borne high above foliage. Grows to 60cm.

Cupid Mix: a compact dwarf marigold growing to 22cm. Foliage almost completely hidden by large, softly curled flowers in primrose yellow, gold and orange.

Guinea Giants: has flowers loosely formed with full centres. Good for cutting or garden display. Sweetly perfumed. Colours range from deep orange to pale lemon. Grows to 60cm.

Guinea Gold: Hardy, free-flowering habit. Magnificent golds with loosely formed flowers. Sweetly scented.

French Marigolds

Aquarius: has dwarf, double-crested flowers. Early to bloom, in shades of yellow, gold, orange and mahogany red with some bi-colours.

Russet and Gold: a dwarf plant growing to 20cm with a full range of rich mahoganys, browns, yellows and many combination shades.

Petite Mixed: a dwarf, growing to 15cm high. Double flowers covering a mass of large blooms from early summer until autumn. Brilliant mixture of colours. Hardy and reliable.

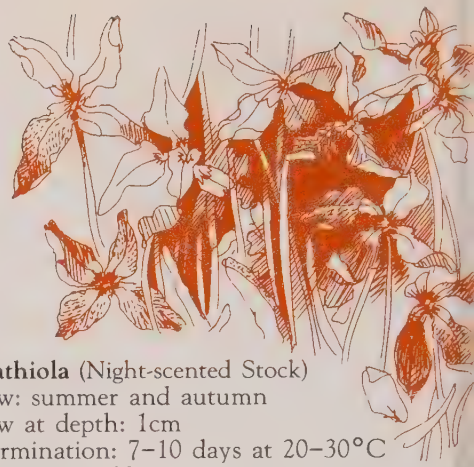
Available as seedlings

Inca series: has double flowers on compact plants. Available in gold, orange and yellow.

Limelight: has large carnation-type flowers in lime green. Dwarf plants growing 35–40cm.

Boy O Boy: an excellent dwarf variety. Early flowering with compact habit. Fully double, crested flowers.

Queen Sophia: has anemone-type flowers on dwarf plants growing 30–35cm.

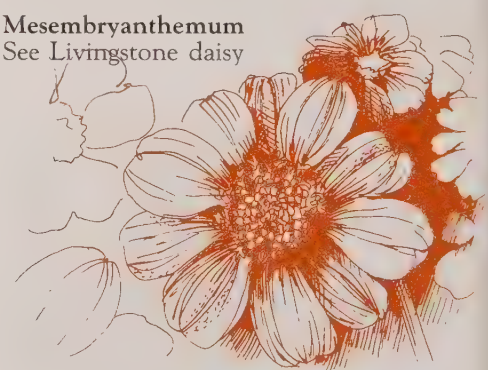


Mathiola (Night-scented Stock)
Sow: summer and autumn
Sow at depth: 1cm
Germination: 7–10 days at 20–30°C
Plant space: 30cm
Height: 20cm
Flowers in: 12 weeks

A hardy annual which is strongly scented. The daytime scent is subtle but on cool overcast days and especially in the evening the spiced, honey fragrance is particularly strong. Suitable for use as cut flowers, in borders, bedding plants, or in containers. Sow outdoors in spring or indoors 6–8 weeks prior to transplanting. Do not cover seed as light is required for germination. In mild climates sow outdoors in autumn for late winter and early spring flowers.

Plants prefer moist, well drained soil high in organic matter. Plant in full sun or partial shade. Does not flower well in heat, so provide a cool location. Do not over-water as stocks are prone to root rot; plant far enough apart to allow good air circulation. Fertilise with Lush at 3–4 weekly intervals.

Mesembryanthemum
See Livingstone daisy



Mexican Sunflower (Tithonia)
Sow: spring

Sow at depth: 1cm
Germination: 7–21 days at 20°C
Plant space: 60cm
Height: 2m
Flowers in: 14 weeks

Another daisy-type flower with orange or scarlet flowers which bloom continuously from midsummer to midwinter. One of the largest plants grown as an annual, with stems which may reach over 2 metres although 1 metre is normal. The rich, intense colours of the flowers create strong effects. Plants will require staking in strong winds. Used as a background screen, at the rear of a border or for cut flowers. Sow seed outside in spring or indoors 6–8 weeks prior to transplanting. Cover seeds sparsely, as light may assist germination. Prefers average well drained soil and tolerates heat and drought. Do not over-water.



Mignonette (Reseda)
Sow: spring
Sow at depth: ½cm
Germination: 15–20 days at 15–20°C
Plant space: 15–20cm
Height: 30cm
Flowers in: 12 weeks

This dwarf, spring-flowering annual is an old-time favourite, grown particularly for its spicy aroma rather than the small orange-yellow flower spikes. Suitable for use as cut flowers for fragrance, in containers, border and bedding plant. Sow seed outside in early spring. Does not transplant well. Do not cover seed, as light is required for germination. Prefers a fertile, well drained, moist soil high in organic matter. Plant in full sun or partial shade. Prefers cool summers. Keep moist and feed with Lush every 2–3 weeks.



Morning Glory (Ipomoea)
Sow: spring
Sow at depth: 1cm
Germination: 5–7 days at 25°C
Plant space: 1m
Height: 6m
Flowers in: 16 weeks

An evergreen, twining climber with large, trumpet-shaped flowers. Leaves are soft and heart-shaped. Suitable for use as a screen, trellis, on letter boxes, dead trees, etc. The hard outer seed coat may need nicking or soaking in water for 2–3 hours prior to planting. Sow outdoors in permanent garden position in spring; transplanting is difficult. Alternatively raise in individual peat pots.

Prefers, a light, sandy, well drained soil, but will grow in most conditions. Tolerant of dry soil. Plant in full sun. The climbing vine must have support to wrap itself around. The vines can grow upwards or cascade down over walls and banks or from hanging baskets and can also be grown prostrate over the ground. The best flowers are produced in the cool of late summer and autumn. Very easy to grow.

Varieties are:

Heavenly Blue: which produces glorious blue flowers.

Scarlet O'Hara: with rosy crimson flowers.

Myosotis
See Forget-me-not



Nasturtium (Tropoleum)
Sow: spring
Sow at depth: 1–2cm
Germination: 7–14 days at 18°C
Plant space: 30cm
Height: variable
Flowers in: 10–12 weeks

Adaptable, colourful annuals with climbing or trailing habit. Flowers in a range of yellow, orange and red. The attractive foliage is edible, and adds a peppery flavour to salads. Suitable for growing on a trellis, screen, walls, hanging baskets, window boxes and containers. Sow outdoors in spring directly into permanent garden position. Plant in a sandy, well drained soil. If soil is too rich there will be foliage growth at the expense of flowers. Grows best in regions with dry cool summers. Tolerates droughts. Easy to look after.

Nasturtiums will need special support in order to climb, as they lack any appendages for clinging and do not truly twine but rather twist and snake about. Trailing nasturtiums are excellent in hanging baskets.

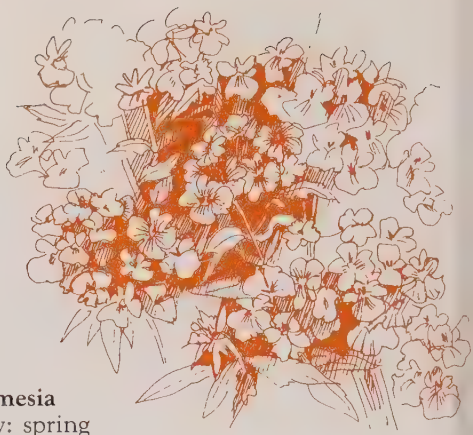
Varieties are:

Gleam hybrids: with semi-double, fragrant flowers in a wide range of colours. Slightly trailing habit.

Golden Gleam: has double blooms of a golden yellow. Sweetly scented. Non-trailing habit.

Scarlet Gleam: has sweetly scented double flowers in rosy crimson. Produced in profusion.

Trailing Matchless: a brilliant mix of climbing and trailing types. Excellent for hanging baskets or large pots.



Nemesia
Sow: spring
Sow at depth: ½cm
Germination: 10–14 days at 20°C
Plant space: 25cm
Height: 30cm
Flowers in: 14 weeks

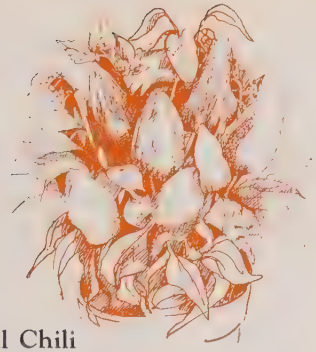
A quick-growing, hardy annual with clusters of tiny snapdragon-like flowers on top of bushy stems. Suitable as an edging, bedding, borders, rock gardens, walls, containers and as cut flowers. One of the brightest plants for late winter and spring flowering. The trend has been to develop the dwarf compact types in preference to the taller nemesias. Raise in trays of seed-raising mix or sow directly into garden position. Cover seed with mix, firm down and keep moist with a fine mist of water. Plant in a fertile, moist, well drained soil rich in organic matter. Will not tolerate excessive heat or humidity. Thrives where the summers are cool and dry. Plant in full sun or partial shade. Water and fertilise with Lush liberally. Pinch young plants to encourage dense growth. Cut the plants back after the first wave of flowering.

Varieties are:

Carnival: a leading dwarf variety. Large flowers of gold, orange, scarlet and red on strong bushy plants. Grow to 30cm tall.

Dwarf Globe: a compact, large-flowering strain in a brilliant range of colours including reds, pinks, yellows and orange.

Night Scented Stock
See Mathiola



Ornamental Chili
Sow: spring and summer
Sow at depth: ½cm
Germination: 21–25 days at 20–28°C
Plant space: 60cm
Height: 25cm
Flowers in: 12 weeks

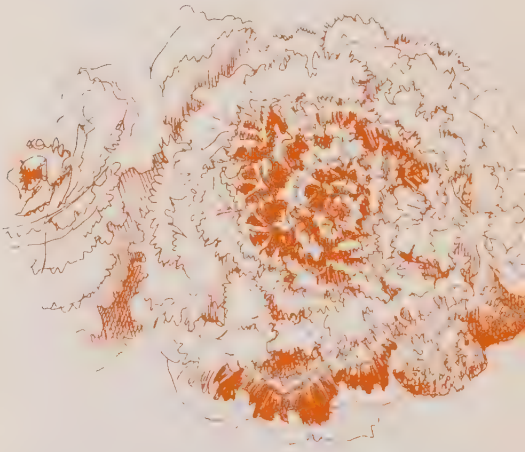
An increasingly popular bedding plant. The brilliant red fruits of varying shape and size undergo dramatic, cheerful colour changes from yellow, orange to red. Plant in large bed or use to edge a border. Very suitable for containers. Perennials in mild climates, and one of the most heat resistant ornamentals. Frost tender.

Sow seed in trays of seed-raising mix. Cover seed with mix, firm down and keep moist with a fine mist of water. Plant in a moist, rich soil high in organic matter. Prefers full sun but tolerates partial shade. Shelter from strong winds. Keep soil evenly moist and liquid-feed with Lush to encourage and prolong flowering and fruiting.



Ornamental Gourd
Sow: spring
Sow at depth: 2cm
Germination: 5–10 days at 20–30°C
Plant space: 1m
Height: 2–3m
Flowers in: 16 weeks

A quick-growing annual vine closely related to cucumbers and pumpkins. The ornamental fruits come in curious shapes and colours, and can be dried to preserve for indoor decoration. Raise in trays of seed-raising mix or direct sow into garden position. Cover seed with mix, firm down and keep moist with a fine mist of wter. Plant in full sun in well fertilised soil rich in organic matter. Train on a trellis or a fence and pick when the stem of the gourd begins to dry up. To preserve, punch the end close to the stem with a long needle to let air inside. Hang for several months in a well ventilated place. The seeds will rattle when the gourds are fully dry. Wash and wax the skin.



Ornamental Kale
Sow: summer
Sow at depth: ½cm
Germination: 10–14 days at 15–30°C
Plant space: 15cm
Height: 15cm
Flowers in: 15 weeks
An unusual, decorative plant which is likely to bring attention. The bright leaves are fringed with red and white, providing an eye-catching display. Sow seed in trays of seed-raising mix. Cover seed with mix, firm down and keep moist with fine mist of water. Plant in a moist, well drained soil in full sun. Flowering Kale will perform better and more colourfully if grown in the cooler temperatures of autumn. While reputedly edible this variety is likely to be tough and bitter. Suited for use in bedding, pot plants, or as ground cover.



Painted Daisy (Chrysanthemum sp.)
Sow: autumn and spring
Sow at depth: ½cm
Germination: 10–18 days at 20°C
Plant space: 30cm
Height: 60cm
Flowers in: 14 weeks

A hardy annual chrysanthemum with daisy-like flowers produced in an array of colours including blue, rose pink. Painted daisy forms clumps that gradually increase, sending up new shoots. Long-lived and not invasive. Sow outdoors after danger of frost is past or indoors 8–10 weeks before transplanting. Plant in a well drained soil high in organic matter. Will not tolerate wet soil in winter. Plant in full sun or partial shade. Easy to look after and will tolerate moderate drought. Seldom needs staking. Cut all stems to the ground after flowering to encourage second flowering in late summer.



Pansy
Sow: summer and autumn
Sow at depth: ½cm
Germination: 7–21 days at 15–30°C
Plant space: 25cm
Height: 20cm
Flowers in: 16 weeks

A popular, low-growing perennial grown as an annual (because heat destroys plants), with large, open-faced flowers in many colours. The velvety blooms appear in spring and early summer. Used as bedding, edging, rock gardens, containers and as cut flowers. In mild climates, sow seed directly outside in late summer or winter for an early spring flowering. Elsewhere sow in summer for autumn flowering. Plant in a rich, moist, well drained soil high in organic matter. Grow in full sun or partial shade. Does not tolerate heat and will do best in areas with a cool summer. Mulch soil to keep roots cool. Fertilise regularly with Lush and keep well watered. Remove faded blooms to encourage new buds and prolong flowering. If the first flowers are small, remove some of the buds to increase the size of those remaining.

Varieties are:

Englemans Giants: a free-flowering, decorative strain with giant blooms in a range of colours. The yellow centres are whiskered.

Trimardeau: has large flowers in a wide range of colours produced over a long period.

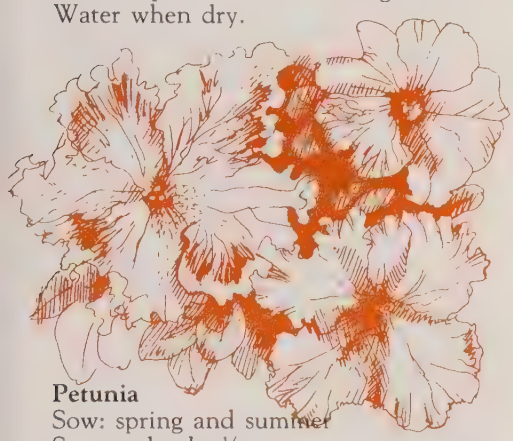
Jumbo Super Giants: a compact early flowering variety developed for their extra large flowers. Maximum plant height 12cm.



Penstemmon
Sow: spring and summer
Sow at depth: ½cm
Germination: 7–10 days at 18°C
Plant space: 40cm

Height: 60–90cm
Flowers in: 12 weeks

Produces colourful, trumpet-like flowers on stately spikes in rose pink and lavender. Mostly suited to mild coastal and humid climates with temperate winters. Useful for bedding, border and cut flowers. A perennial in mild areas but in cold climates it is treated as an annual. Delicate in nature, the plants are generally not long-lived. Raise in trays of seed-raising mix or direct sow into garden position. Cover seed with mix, firm down and keep moist with fine mist of water. Plant in a well drained soil. Full sun is best but plants will tolerate light shade. Water when dry.



Petunia
Sow: spring and summer
Sow at depth: ½cm
Germination: 5–15 days at 20–25°C
Plant space: 30cm
Height: 30cm
Flowers in: 12 weeks

One of the most colourful annuals for the summer garden. The new varieties are a tremendous improvement on the old. The trumpet-shaped flowers come in single or double forms, ruffled or plain edged, in many colours. Useful for bedding, borders, containers and hanging baskets.

Sow seed indoors 10–12 weeks prior to planting out. Press them gently into the seed raising mix but do not cover, as light is required for germination. A light, sandy soil which is well drained is best. Plant in full sun (shade will discourage flowering). Water moderately and feed each 3–4 weeks with Lush. Pinch or shear plants after the first wave of flowering to encourage a more compact plant and more flowers. Petunias are easy to start outside in warm weather and are one of the few annuals whose seedlings can stand hot sun.

Varieties are:

Border Gem: a dwarf, free-flowering plant producing a mass of blooms in rose, pink, purple and light blue.

Colourama: a free-flowering mix with brilliant, clear colours. Dwarf growth habit.

Fire Chief: has bright scarlet blooms on compact dwarf plants.

Fluffy Ruffles: with giant, ruffled and veined flowers.

Carnival: a range of mixed colours. Large flowers.

Giants of California: with finely fringed and large flowers in an assortment of colours.

Red Picotee: with bi-coloured red and white flowers. An outstanding, vigorous hybrid which flowers continuously through a range of weather conditions.

Blue Picotee: with bicoloured blue and white flowers; an ideal companion and contrast to Red Picotee.



Phlox
Sow: spring and summer
Sow at depth: ½cm
Germination: 10–15 days at 10–30°C
Plant space: 10cm
Height: 25cm
Flowers in: 8 weeks

Phlox is one of the brightest and quickest-growing of summer flowers. Useful for massed beds, borders, edging, containers, rock and wall gardens, cut flowers and naturalising. Raise in trays of seed-raising

mix or sow directly into garden position. Cover seed with mix, firm down and keep moist with a fine mist of water. Plant in a moist, well-drained soil high in organic matter. Prefers full sun. Tolerates heat although flowers will decline in the hottest part of summer. Fertilise with Lush every 2–3 weeks and keep moist. Avoid watering late in the day to avoid disease problems. Remove flowers as they fade. Phlox are available in a wide range of colours and forms.

Varieties are:

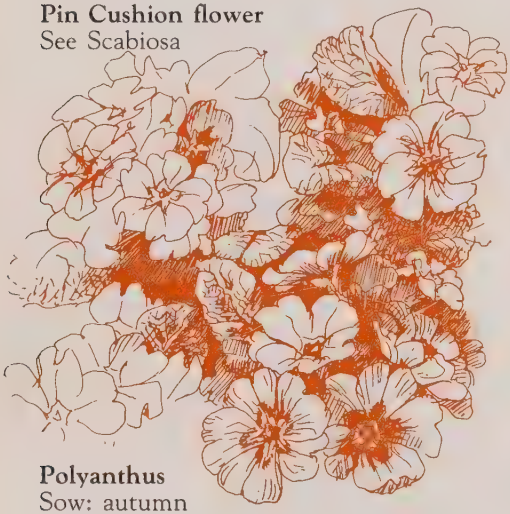
Bright Eyes: a wide range of sparkling flowers with a white contrasting centre. A taller strain growing to 40cm.

Brilliant Mixed: a range of brilliant red, clear pink and buff-coloured flowers.

Super Dwarf: has compact bushy plants covered with large flowers in reds, blues, salmons, pinks and pastel shades. Grows 20–25cm.

Nana Compacta: a range of brilliantly coloured flowers which bloom through the summer.

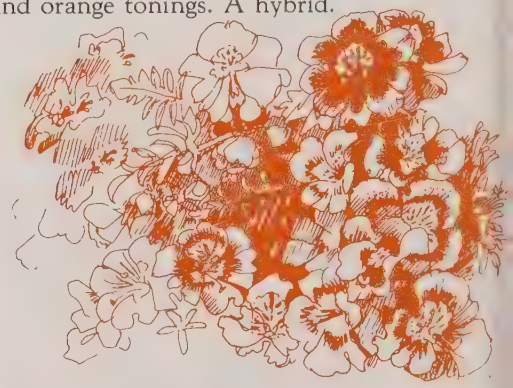
Pin Cushion flower
See Scabiosa



Polyanthus
Sow: autumn
Sow at depth: 1mm
Germination: 21–40 days at 21°C
Plant space: 30cm
Height: 25cm
Flowers in: 24 weeks

Spring-flowering, primrose-like plants. A perennial often grown as an annual. Polyanthus grows well in cool, sheltered, partially shaded positions. The plants can last for 2–3 years and can be divided when they are dormant. However, in open sunny positions they are short-lived. Polyanthus prefer a fertile soil and respond to liquid fertiliser. Sow seeds in late summer and early autumn. Seeds are fine and germination can be slow and erratic. Press seed firmly into seed-raising mix and keep the surface moist. Suitable for beds, borders, edging or as a pot plant.

The main variety is **Pacific Giant**, with clusters of large flowers in a range of warm colours including maroon, yellow and orange tonings. A hybrid.

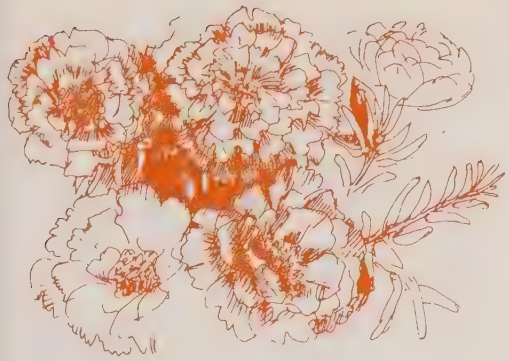


Poor Man's Orchid (Schizanthus)
Sow: summer and autumn
Sow at depth: ½cm
Germination: 20–30 days at 15–20°C
Plant space: 30cm
Height: 45cm
Flowers in: 14 weeks

Spring flowering annuals with orchid like flowers in shades of pink to violet. Adaptable and easy to grow. The flowers resemble small butterflies which hover over masses of delicate lacy foliage. Ideal as a bedding, border plant and superb in containers as they flower freely when the roots are slightly constricted. Excellent for hanging baskets and they are good cut flowers.

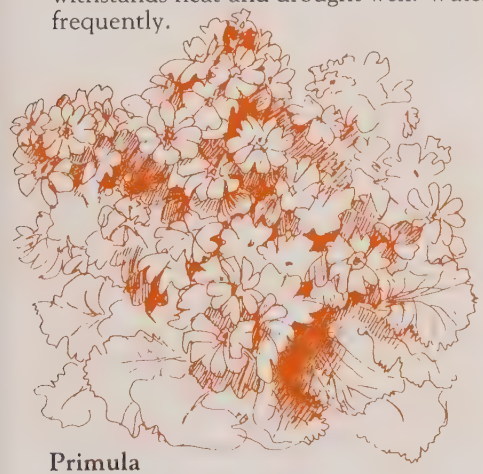
Sow seed indoors 12 weeks before transplanting outside. The fine seed should be gently pressed into the surface of the seed-raising mix.

Prefers a rich moist soil high in organic matter. Must have perfect drainage. Performs best in regions with cool summers. Plant in full sun or partial shade. Water moderately.



Portulaca (Sun Plant)
Sow: spring and summer
Sow at depth: ½cm
Germination: 10–14 days at 15–20°C
Plant space: 10cm
Height: 20cm
Flowers in: 6 weeks

A quick-growing, hardy annual with soft flowers in bright colours from lemon, mauve, salmon, crimson and white. Excellent for edging, borders, banks and rockeries. Thrives in situations of intense heat, dry rocky soil, and sandy conditions. Plant forms loose trailing mats with brittle stems and small fleshy leaves covered with brilliantly coloured flowers. Flowers close late in the day and during cloudy weather. Portulaca reseeds readily. Easy to sow directly outside in spring, withstands heat and drought well. Water frequently.



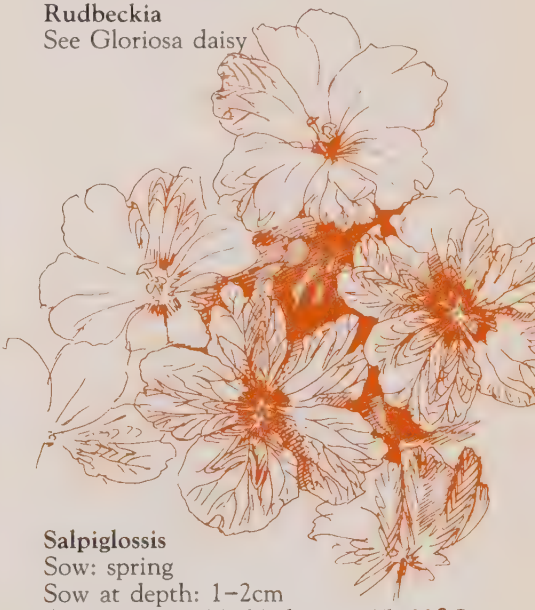
Primula
Sow: summer and autumn
Sow at depth: ½cm
Germination: 21–28 days at 20°C
Plant space: 20cm
Height: 40cm
Flowers in: 24 weeks

A charming, popular plant with delicate flowers forming a cloud of colour. Perennial, but grown as a spring flowering annual. While traditionally regarded as shade-loving plants most primulas grow equally well in full sunlight. They are ideal plants for bedding, borders and are attractive when grown in troughs, pots and window boxes. They prefer a fertile soil with added organic matter. Sow seed from midsummer to early autumn. Fine seeds and small seedlings are delicate. Sow thinly over seed-raising mix and press firmly into the surface. Transplant carefully on a cool cloudy day and water until well established. Feed with Lush when flower buds appear. A good variety is **Primula malacoides**, a vigorous compact variety producing sturdy plants 20–25cm high. Select for its large carmen rose flowers which hold well in the sunlight.

Prince of Wales Feather
See Celosia

Reseda
See Mignonette

Rudbeckia
See Gloriosa daisy



Salpiglossis
Sow: spring
Sow at depth: 1–2cm
Germination: 14–21 days at 15–20°C

Plant space: 15cm
Height: 90cm
Flowers in: 5–12 weeks

A tall bedding plant for summer flowering. The large trumpet-shaped flowers come in shades of gold, bronze, red and violet. Sow seed in trays of seed-raising mix, cover seed with mix, firm down and keep moist with a fine mist of water. Take care with the fine seeds. Plants require excellent drainage. Best in a rich light sandy soil high in organic matter. Plant in full sun. Performs best in regions with cool summers. Water moderately. Plants may require support. Protect from the wind.



Salvia
Sow: spring
Sow at depth: 1cm
Germination: 12–15 days at 21–24°C
Plant space: 20cm
Height: variable
Flowers in: 10 weeks

A popular bedding plant requiring little attention and provides some of the brightest intense reds and scarlets in the garden. Will flower from early summer to frost. Used as bedding plants, borders, containers and as cut flowers.

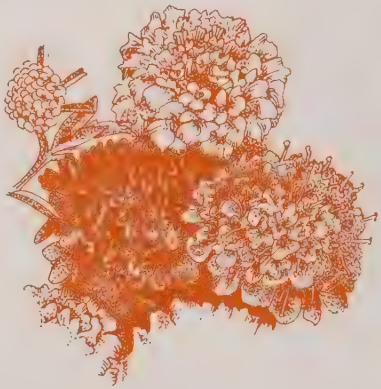
Sow seed 6–8 weeks indoors prior to transplanting in spring in trays of seed-raising mix. Cover seed with mix, firm down and keep moist with a fine mist of water. Transplant into well drained rich soil high in organic matter. Performs well in full sun or light shade. Keep well watered. Tolerant of mild drought. Liquid-fertilise with Lush every 3–4 weeks.

Varieties are:

Blaze of Fire: an early flowering dwarf salvia with brilliant scarlet flowers. Quick growing and flowers for several months during summer. Grows to 30cm.

Dress Parade: a dazzling mixture of early flowering dwarf salvias, the compact plants produce numerous branches and flower spikes in a wide range of bright colours including rose, pink, purple and white.

Splendons Bonfire: the traditional salvia with fiery scarlet flowers on long spikes. Grows to 70cm.



Scabiosa (Pin Cushion flower)
Sow: spring
Sow at depth: 1cm
Germination: 10–15 days at 20–25°C
Plant space: 30cm
Height: 75cm
Flowers in: 20 weeks

Unusual, fluffy flowers with many double petals bristling with hundreds of white or yellow stamens like pins in a cushion, held on tall strong fleshy stems. They are ideal for cutting, and as bedding and border plants. Sow outside in garden in spring or raise indoors 4–5 weeks prior to transplanting. Plant in a rich well drained soil high in organic matter in full sun. Easy to care for. Water moderately but avoid moisture standing on the foliage for any length of time.

Scarlet Flax
See Linum

Schizanthus
See Poor Man's Orchid



Snapdragon (Antirrhinum)
Sow: all year
Sow at depth: 1cm
Germination: 10–14 days at 20°C
Plant space: 20cm
Height: various
Flowers in: 14–15 weeks

The crisp, tapering spikes of snapdragons are a popular sight. The flowers come in a range of soft pastel yellows, pinks, warm reds, burgundies and bronzes. The varied form and size give them versatility in borders and beds. The flowers when squeezed open up like jaws, hence the name.

Plant in a rich, well drained soil high in organic matter. Prefers full sun and tolerates heat well. Water moderately and liquid-fertilise at 2–3 week intervals with Lush. Pinch young plants to encourage branching and better flowering. Remove faded blooms to prolong flowering and prevent seeds forming. Spray with Saprol to prevent rust and mildew.

Varieties are:

Intermediate Mixed: with superb, large flowers in a wide range of colours. Grows to 45cm high.

Large Giant Mixed: a magnificent range of colours on stems up to 80cm.

Tom Thumb: a dwarf variety growing to 20cm. A bright colour range, excellent for low borders and rockeries.

Available as seedlings

Little Darling: a semi-dwarf hybrid growing to 30cm. Butterfly-type flowers.

Madame Butterfly: a hybrid with large, fully double flowers. Grows to 75cm.

Spider flower
See Cleome

Star of the Veldt
See Dimorphotheca



Statice (Limonium)
Sow: spring and summer
Sow at depth: ½cm
Germination: 15–28 days at 20°C
Plant space: 40cm
Height: 75cm
Flowers in: 20 weeks

Attractive flowers for garden display, cutting and drying. Ideal for the rock garden and an excellent coastal plant. Sow seed outdoors in spring or indoors 8–10 weeks before transplanting. Seedlings are flat and squat and should be transplanted when large enough to handle. Plant in well drained, light, sandy soil in full sun. Tolerates heat, drought and salt spray well. Water only when dry. To preserve, cut flowers when fully open and hang upside down in a cool, dark place to dry.



Stock (Mathiola)
Sow: autumn and spring
Sow at depth: ½cm
Germination: 7–10 days at 21°C

Plant space: 30cm
Height: 60cm
Flowers in: 14 weeks

One of the most popular spring-flowering annuals. The flowers provide a magnificent display in beds and borders and are excellent for cutting. Highly fragrant. Sow seed in trays of seed-raising mix. Cover seed with mix, firm down and keep moist with a fine mist of water. Plants prefer a fertile, well drained soil high in organic matter. Plant in full sun or light shade. Stock does not flower well in heat, so provide cool location. Water adequately but not late in the day.

Apply Lush at 3–4 weekly intervals. For fragrance in the garden, stocks are indispensable. During the day their scent is subtle and often elusive but on moist, overcast days and during the evening the spiced honey fragrance is much stronger. Stocks grow best in cool, moist weather. Their longest season of flowering is in coastal areas with mild humid summers. Most double strains available produce from 60–85% of double flowering plants. Those producing single flowers are likely to be taller and thin leafed and more vigorous in the seedling stage.

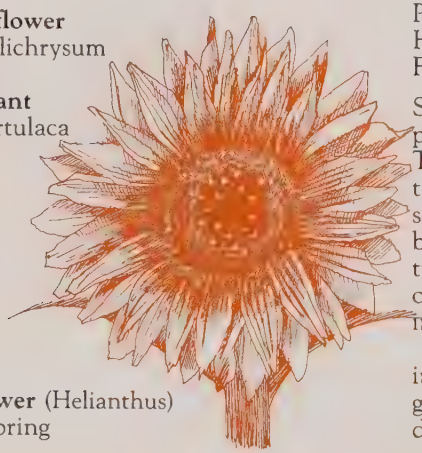
Varieties are:

Giant Perfection: a popular semi-bush type. The central spike is followed by lateral spikes with huge rosettes of fragrant flowers in many brilliant colours.

Nice Beauty Mixed: produces a large percentage of double blooms in an excellent colour range.

Straw flower
See Helichrysum

Sun plant
See Portulaca



Sunflower (Helianthus)
Sow: spring
Sow at depth: 1cm
Germination: 10–20 days at 20–30°C
Plant space: 50cm
Height: 1.5m
Flowers in: 12 weeks

Sunflowers are large, decorative yellow flowers which also produce edible seed. The coarse foliage and leggy habit make them suitable for background use at the rear of a border or as a screen. The seeds also attract birds.

Sow outdoors after frost or start indoors in peat pots 4–8 weeks ahead. This plant does best in a light, well drained soil in full sun. Tolerant of heat and drought. Easy to look after but attracts many insects and may need spraying with Orthene. May require staking. Shelter from wind.

Swan River Daisy
See Brachycome



Sweet Pea
Sow: spring to autumn
Sow at depth: 1cm
Germination: 10–14 days at 12–18°C
Plant space: 20cm
Height: various
Flowers in: 12–15 weeks

Sweet peas are among the most attractive, prolific and sweet-smelling of flowers. They are extremely popular and one of the few annuals which have clubs and societies devoted to their culture and breeding. They have been improved tremendously in flower form, size and colour range from the original rather insignificant purple flower from Sicily.

Raise in trays of seed-raising mix, individual peat pots or sow direct into garden position. They prefer a fertile, well drained soil high in organic matter in full

sun. In shaded areas they will do poorly. Keep well watered and fertilised. The roots should be mulched to keep them cool. Provide support for climbing types. Cut back to encourage denser branching and flowering, particularly if plants are spindly. Laterals will appear when the plants are 20–30cm tall. For general garden display, allow these to grow. However for exhibition blooms and large flowers, remove two thirds of the lateral growth and buds and reduce the number of tendrils to the bare number required for support. Pick faded blooms to prolong flowering.

Sweet peas are very susceptible to soil fungus diseases which can adversely affect germination. For best results, plant in rows of seed-raising mix and dust the seed with a fungicide before planting. Do not grow sweet peas in the same place two years in a row. In small areas it may be necessary to sterilise the soil with Basamid. Avoid planting in poorly drained or heavy soils and do not over-water.

Varieties are:

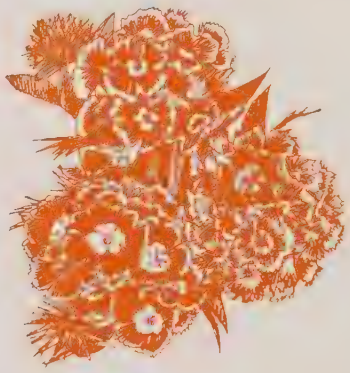
Seventh Heaven: a quick maturing variety with at least five flowers per stem. Individual flowers are large and frilled with long, strong stems. The colours include salmon, pink, deep rose, orange, mauve and caribbean blue.

Bijou Dwarf: grows only 30–45cm high with ruffled flowers in a variety of shades. Easy to grow and pick. The plants are not as susceptible to wind damage as tall varieties.

Colourcade: a pack containing six individual distinct colours. The range is notable for the size of the individual flower and the long, strong stems. Medium to late flowering. Colours include Columbine (rosy lavender), Pageboy (navy blue), White knight (white), Showgirl (royal cream pink), Gaytime (royal rose pink) and Candyfloss (rose pink).

Two Tone: a blend of distinctive sweet peas bred in New Zealand by Dr Keith Hammett. Each flower has two colours, the standard being different from the wings, and are highly scented. Colour combinations include, rose, white, pink, lavender and navy. Summer flowering, plant in spring. They require 11–12 hour days length for flowering and prefer an open position in full sun.

North Shore: an outstanding, two-toned sweet pea. Each stem has 4 large frilly flowers consisting of a navy-blue standard petal and a violet wing petal. Bred in New Zealand by Dr Keith Hammett. An award winning bloom at the Royal Horticultural Society, England.



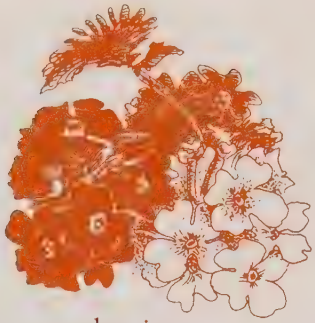
Sweet William (Dianthus sp.)
Sow: spring
Sow at depth: ½cm
Germination: 10–14 days at 20°C
Plant space: 20cm
Height: 45cm
Flowers in: 20 weeks

A charming, old-fashioned dwarf plant which is a short-lived perennial usually grown as a biennial. It has single and double sweetly scented flowers in a variety of colours. Flowers in summer for 6–10 weeks. Easy to look after, requiring moderate watering. Suits most soils provided they are well drained. Declines in summer heat. Suitable for use in edging, bedding, containers, rock gardens, cut flowers. Plant in slight shade.

Tithonia
See Mexican sunflower

Transvaal Daisy
See Gerbera

Tropoleum
See Nasturtium



Verbena
Sow: autumn and spring
Sow at depth: ½cm
Germination: 21–28 days at 10°C
Plant space: 30–40cm
Height: 15–20cm
Flowers in: 12 weeks

A trailing perennial which may persist for 2–3 years. Used for ground cover, beds, rock gardens, walls and containers. Bright and intense colours with greyish aromatic foliage. One of the easiest plants for hot, dry spots in the garden. Sow seed in trays of seed-raising mix. Cover seed with mix, firm down and keep moist with a fine mist of water.

The fine seed is sensitive to dampness, so do not over-water. Plant out in a well drained, sandy soil of high fertility, in full sun. Tolerant of heat but flowering may decline. Moderately tolerant of drought. Verbena will not flower well in shade and in damp air. Water only moderately. Fertilise with Lush every 2–3 weeks.



Viola (See Pansy)
Violas are close relatives of pansies and are grown in the same way. They have smaller flowers, can be planted closer together than pansies and will flower over a long period.

Varieties are:
Toyland: a hybrid selection which displays characteristic vigour. Compact plants and colours include wine, pure gold, yellows, blues, reds, and whites to give an amazing array.



Virginian Stock (Chieranthus)
Sow: spring and autumn
Sow at depth: ½cm
Germination: 10–14 days at 20°C
Plant space: 15cm
Height: 20cm
Flowers in: 14 weeks

A dainty, spring-flowering annual with tiny flowers in white, cream, lavender and pink. Extremely hardy and flowers quickly after sowing. Adaptable to a range of soil. Additional fertiliser will be of benefit. Prefers a warm, sunny aspect but tolerant to partial shade. Suitable for use as edging, rock gardens, window boxes. Raise in trays of seed raising-mix or sow directly into garden position. Cover seed with mix, firm down and keep moist with a fine mist of water. Avoid disturbing shallow root system when cultivating. Feed with Lush when buds start to show.



Viscaria
Sow: spring
Sow at depth: ½cm
Germination: 14–16 days at 20°C

Plant space: 15cm
Height: 30cm
Flowers in: 12 weeks

Viscaria gives masses of dainty summer flowers in shades of pink, mauve, lavender and blue on thin branching stems. They prefer a warm sunny position but are adaptable to both light and heavy soil provided there is additional general fertiliser added during preparation. Very effective when massed. Ideal for rockeries, borders and naturalising.



Wallflower
Sow: summer, autumn
Sow at depth: 1cm
Germination: 5–7 days at 15°C
Plant space: 30cm
Height: 50cm
Flowers in: 24 weeks

An old-fashioned, spring-flowering annual. Highly fragrant and suitable for growing in rock gardens, walls, bedding, borders and as cut flowers. Raise on trays of seed-raising mix or direct sow into garden position. Cover seed with mix, firm down and keep moist with a fine mist of water. Requires excellent drainage and fertile soils. Plant in full sun or light shade. Performs best in coastal areas with cool summers and high humidity. Keep soil moist. Ideal for poking into cracks and crevices in dry rock walls and banks. Place near paths and entrances so the perfume can be enjoyed.



Zinnia
Sow: spring
Sow at depth: ½cm
Germination: 5–7 days at 20°C
Plant space: 20–30cm
Height: 30cm–1m
Flowers in: 12 weeks

A hardy summer flowering annual particularly suited to New Zealand conditions. Available in an almost limitless range of bright festive colours. Very easy to grow. Used in bedding, borders, containers and cut flowers. Raise in trays of seed-raising mix or direct sow into garden position. Cover seed with mix, firm down and keep moist with a fine mist of water.

Suited to a fertile well drained soil rich in organic matter. Best in hot dry climates with long summers. Plant in full sun and with good air circulation. Avoid planting in cool or damp areas. Zinnias resent root disturbance. Do not allow them to become rootbound before transplanting.

Grow in individual containers rather than trays. Pinch out the plants before transplanting to encourage compact bushy growth. Tall varieties are susceptible to wind damage and require shelter. A dressing of General Garden of 100g per square metre applied prior to planting is adequate in most soils. During flowering, remove spent and damaged blooms to ensure continuous display. Flowering usually begins in midsummer and will continue through into autumn, most varieties providing 8–10 weeks of display. Zinnia flowers are long-lasting as cut flowers but be sure to choose buds that are just starting to open and cut them early in the day.

Varieties are:

Galaxy Bedding: prolific flowering in a brilliant variety of colours. Medium sized blooms fully double flowers and dome-shaped. Grows to 60cm.

Giant Dahlia: bright double blooms on strong stems, continuous flowering. Colours include pink, orange, crimson, scarlet and yellow. Grows to 75cm.

Lilliput Pom Pom: masses of ball-shaped double flowers 3–5cm in diameter. Colours include yellow, pink, red and pastel colours. Plants grow to 60cm.

Thumbelina: a dwarf zinnia with medium-sized flowers in shades of yellow, orange, pink, scarlet and red. Grows 15–20cm high.

Paintbrush: free flowering, early blooming border zinnia in striking vivid colours. Grows to 60cm.

Fireworks: with large double, cactus-

Flower Seed Mixes

A number of mixes of flower seed are available for mass display borders or special situations. These mixtures provide a wide variety of flowers and colour range.

Bouquet of Sunshine: a special blend of many yellow, gold and orange annuals for bouquets and arrangements. All easy to grow and are adaptable to a range of soil conditions. Plant in a warm sunny location in spring. Mix contains celosia, dahlia, escholtzia, rudbeckia and snapdragon.

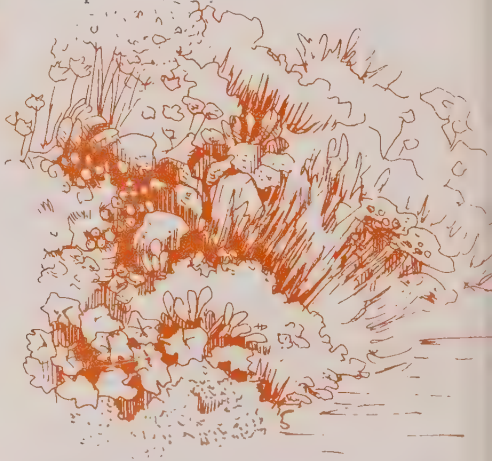


Cottage Garden Mixture: a blend of brightly coloured, free-flowering annuals selected for their old world charm. All easily grown. Sow seed in a warm sunny position, scattering thinly in permanent place. Mix contains coreopsis, dianthus, pansy, petunia, antirrhinum, aquilegia, schizanthus, wallflower, zinnia, salvia, calendula, nemesia and others.





Bouquet of Blue: a mix of easy to grow long stemmed annuals of different blue coloured flowers. Plant in spring in a warm sunny location. Mix contains anchusa, aster, cornflower, cynoglossum, larkspur and salvia.



Rock Garden Mix: a selection of dwarf annual and perennial species ideally suited for rock gardens. An attractive mix which varies in colours and flowering season. It includes candytuft, ageratum, linaria, nemesia, phlox, salvia, sweet William, stock and zinnia.

type blooms. Petals curled and ruffled in a wide range of colours. Flowers over a long season, ideal for cutting. Compact plants grow to 45cm.

Green Envy: an unusual dahlia-type flowered zinnia with flowers in soft limes to emerald green. Plant grows 60–90cm in height.

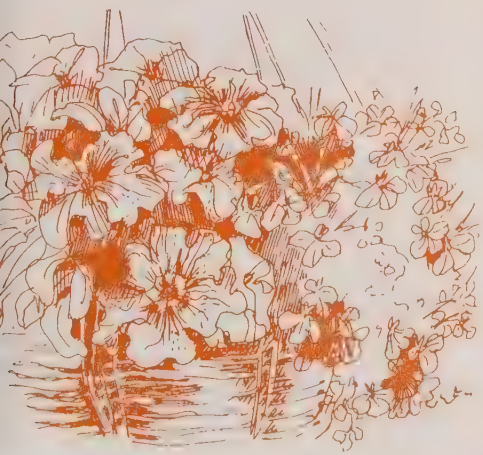


Hot Spots: a mix, all of which thrive in those hot sunny spots. Includes ageratum, calendula, celosia, cornflower, marigold, phlox, salvia, portulaca, vinca, zinnia, verbena, petunia.

Easy-to-grow: a range of easy-to-grow flowers including alyssum, aster, dahlia, marigold, zinnia, hollyhock, cornflower, portulaca, salvia, calendula.



Hanging Baskets: a range suited to growing in hanging baskets including lobelia, impatiens, petunia, morning glory, phlox, bijou sweet pea.



Shade Lovers: a mix of flowers which thrive in shady spots including coleus, impatiens, mignonette, wallflower, forget-me-not, viola.



Colonial Garden Mix: a charming assortment of old world flowers. The collection consists of 18 different varieties packed into 3 sachets of dwarf, medium and tall selections. The collection provides masses of colour in the garden without being prim or formal. The dwarf varieties include: marigold, phlox, zinnia, cockscomb, mignonette, dianthus.

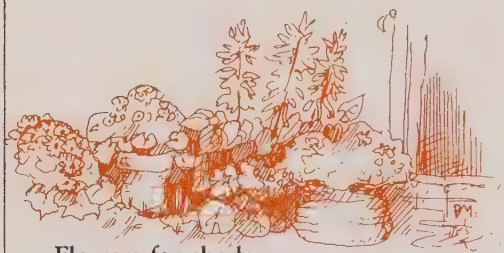
The medium varieties are candytuft, carnation, dahlia, celosia, marigold, stock, snapdragon, sweet william and wallflower.

The tall varieties include hollyhock, foxglove, cosmos, cornflower, larkspur and Canterbury bells.

Easy to grow from seed
Alyssum, cornflower, calendula, calliopsis, candytuft, cosmos, cottage garden mixture, floss flower, linum, marigold, nasturtium, scabiosa, sunflower, sweet pea, viscaria and zinnia.



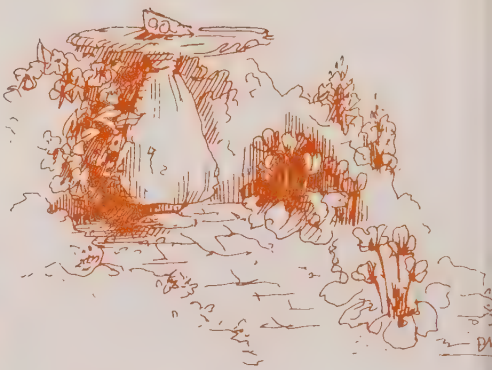
Flowers for fragrance
Alyssum, carnation, mignonette, night scented stock, wallflowers, stock, sweet peas, sweet william, brachycome.



Flowers for shade
Begonia, Canterbury bells, coleus, impatiens, forget-me-not, salvia. viola, aquilegia, balsam, cineraria, polyanthus, poor man's orchid, primula, lobelia, rudbeckia.



Flowers that tolerate hot dry conditions
Balsam, calliopsis, celosia, cleome, cockscomb, cosmos, gaillardia, hollyhock, linum, Livingstone daisy, Mexican sunflower, petunia, phlox, portulaca, salvia, star of the veldt, strawflower, sunflower, brachycome, verbena, zinnia.



Flowers that like moist conditions
Cyclamen, impatiens, lobelia, stock, forget-me-not, viola, cleome.



Suitable as dried flowers
Celosia, gypsophila, helichrysum, statice, Chinese lantern, everlasting daisy, honesty.



Flowers for edging
Alyssum, ageratum, dianthus, linaria, Livingstone daisy, lobelia, marigold (dwarf), nemesia, pansy, petunia, phlox (dwarf), polyanthus, portulaca, primula, salvia (dwarf), wallflower, star of the veldt, brachycome, verbena, viola, Virginian stock, viscaria (dwarf), zinnia (dwarf).



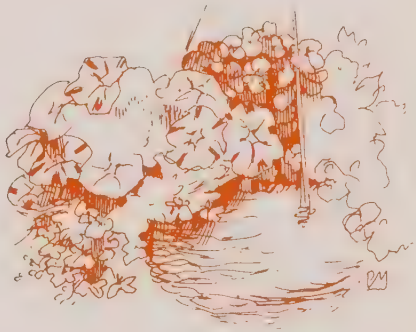
Flowers for rock gardens
Alyssum, balsam, calendula, candytuft, celosia, cockscomb, dianthus, floss flower, gaillardia, geum, lunaria, linum, Livingstone daisy, lobelia, marigold dwarf, mignonette, nasturtium, nemesia, night scented stock, pansy, petunia, phlox, poor man's orchid, portulaca, wallflowers, snapdragon, star of the veldt, statice, Swan river daisy, sweet william, verbena, viscaria, zinnia.



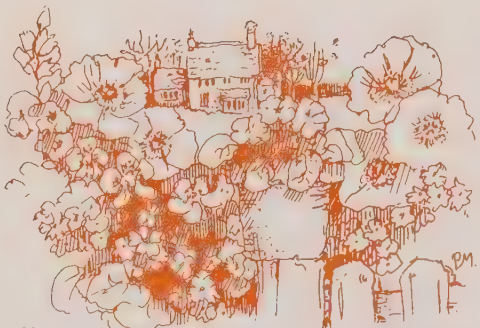
Flowers for screens and trellis
Cathedral bells, hollyhocks, morning glory, nasturtium, sweet pea, scarlet runner beans.



Suitable for cut flowers
Aster, aquilegia, calendula, calliopsis, candytuft, Canterbury bells, carnation, celosia, clarkia, cornflower, cosmos, dahlia, delphinium, dianthus, gaillardia, gardicia, gypsophila, larkspur, linaria, lupin, marigold, Mexican sunflower, mignonette, painted daisy, pansy, phlox, polyanthus, Iceland poppy, primula, scabosia, snapdragon, star of the veldt, statice, stocks, strawflower, sweet pea, sweet william, verbena, zinnia.



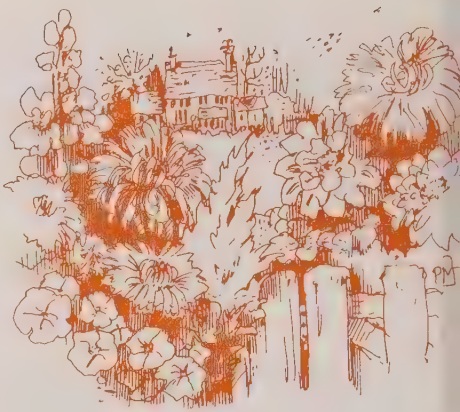
Flowers for hanging baskets
Impatiens, lobelia, petunia, verbena, nasturtium, morning glory, bijou sweet pea.



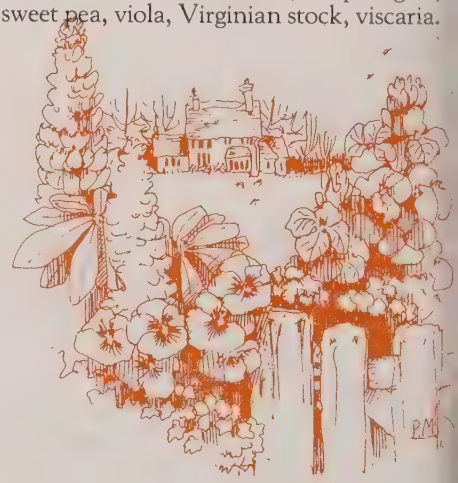
For early spring flowering (autumn sown) Alyssum, anemone, aquilegia, calendula, calliopsis, candytuft, Canterbury bells, carnations, cineraria, clarkia, cornflower, cosmos, delphinium, dianthus, forget-me-not, frescia, gypsophila, hollyhock, linum, larkspur, linaria, lobelia, lupin, mignonette, nemesia, night scented stock, pansy, polyanthus, poor man's orchid, Iceland poppy, primula, scabiosa, snapdragon, star of the veldt, statice, stock, early sweet pea, sweet william, viola, Virginian stock and wallflower.



For midsummer flowering (spring sown) Alyssum, aster, balsam, calliopsis, carnation, celosia, cockscomb, cosmos, dahlia, ageratum, gaillardia, godetia, gypsophila, hollyhock, larkspur, linaria, linum, Livingstone daisy, lobelia, lupin, marigold, Mexican sunflower, mignonette, morning glory, nasturtium, nemesia, nigella, night scented stock, petunia, phlox, salvia, scabiosa, star of the veldt, statice, strawflower, sunflower, verbena, viscaria, Virginian stock, zinnia.



For late autumn flowering (summer sown) Alyssum, aster, calendula, calliopsis, carnation, celosia, clarkia, cornflower, cosmos, dahlia, ageratum, gaillardia, godetia, gypsophila, larkspur, linaria, linum, Livingstone daisy, night scented stock, marigold, mignonette, pansy, petunia, phlox, poor man's orchid, portulaca, salvia, scabosia, snapdragon, sweet pea, viola, Virginian stock, viscaria.



For winter flowering (autumn sown) Ageratum, alyssum, calendula, calliopsis, candytuft, clarkia, cornflower, dianthus, linaria, lupin, mignonette, nemesia, pansy, poor man's orchid, Iceland poppy, primula, snapdragon, stock, night scented stock, sweet pea, viola, Virginian stock, wallflower.





CHAPTER NINE

HERBS

GROWING HERBS is for many an interesting, pleasurable and absorbing activity. Aromatic plants that have been selected from the wild and brought into cultivation, herbs are invaluable for culinary use, fragrance and horticultural interest. There are hundreds of herbs, which all make attractive garden plants.

In general they are hardy, tolerating adverse conditions and neglect better than most plants. Like all growing things, they still respond to care and attention. Most herbs need sunshine, well-drained soil and additional watering in hot, dry periods. Most of the common herbs can be grown in a small area. They are also ideally suited to window boxes, pots, containers and rock gardens.





Annual herbs grow easily from seed. Perennial herbs are mainly grown from cuttings or root divisions. The best time to pick herbs for drying is just as the flower buds appear when the leaves contain the most flavour. With large leafed herbs like mint, sage and basil, take the leaves off individually and place on a drying rack. Turn daily to dry evenly. Small herbs like thyme and marjoram can be picked in bunches, tied in bundles and hung in a dark place for drying. They will take 4–5 days to dry, after which time the leaves can be crumbled or stripped from the branches and stored in air tight containers.

POPULAR HERBS

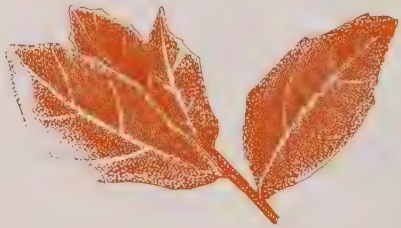
Angelica
Angelica has soft, green, serrated leaves on branching stems, with a celery-like texture. The plant grows up to 2.5 metres high. Grow from seed sown in spring. Seed germination takes 21–25 days at 15–20°C. Plant in sun or light shade. Will do best in a moist soil and a cool climate. The plant will grow as a perennial if the flower stems are removed as they occur. All parts of the plant – leaves, stems, flowers and seed – are used.



Basil
A popular annual herb growing to 40cm high with shiny oval leaves, with a sweet, spicy, clove-like flavour that can be used fresh or dry. Sow seed in spring. Seed germinates in 7–10 days at 15–20°C. The plant prefers full sun but tolerates semi-shade. The mature leaves have the strongest flavour. Regular pinching will keep the plant bushy. Remove flower stems to prolong the life of the plant. There are several varieties available including Sweet Basil, Basil Bush, Purple Basil and Linen Basil.



Bay
The leaves of the bay tree have a distinctive flavour and are used in stews, with fish and often with vegetables. It is an evergreen bush which grows into a tree if not trimmed and pruned.



Borage
An annual herb growing to 90cm high, with bright, blue, star-shaped flowers. Both the leaves and flowers are edible, having a slight cucumber flavour. Leaves are picked before the flowers are formed. Can be used in salads and sandwiches. The older leaves tend to develop an unpleasant hairy surface. The flowers can be crystallised or scattered in salads or drinks. Grow from seed sown in spring. Sow direct into garden position as seedlings are difficult to transplant. Seeds germinate in 7–10 days at 15–20°C.



Caraway
A biennial plant with delicate, ferny foliage similar to the carrot and with a small tapering root. Leaves, roots and seeds can all be used and have a slight aniseed flavour. Sow seeds in spring or autumn direct into garden soil, as the seedlings are difficult to transplant. Germination takes 10–14 days at 15–28°C. Grow in a well-drained soil in semi-shade.



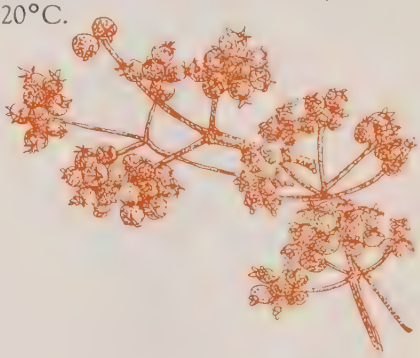
Chervil
An annual herb growing to 60cm high with divided, parsley-like leaves and a mild, aniseed flavour. Grows well in partial shade, and prefers a moist situation. Sow seed in spring, in peat pots or direct into garden soil as seedlings resent transplanting. Germination takes 7–14 days at 15°C. Leaves are ready to use 8 weeks after sowing. Pick outside leaves first to encourage growth from the centre.



Chives
Perennial plants which grow in grass-like clumps, making an ideal edging plant. They grow well in sun or semi-shade. New plants can be started by dividing clumps or alternatively sowing seed in spring. Seeds germinate in 10–14 days at 15–20°C. Harvest leaves from the base. Chopped leaves have a delicate onion flavour and are used in salads, omelets, soups and sandwiches.



Coriander
Coriander or chinese parsley is an annual herb growing to 40cm high. The plants prefer full sun but will tolerate semi-shade. The parsley-like leaves have a sharp, peppery taste and the mature seeds are used for flavouring salads, breads and confectionery. Sow seed in spring direct into the garden soil. Completely cover seed as darkness aids germination. Seed germination takes 10–14 days at 15–20°C.



Dill
An annual herb growing to 90cm high with blue-green feathery leaves and umbrella-shaped flower heads. Prefers full sunlight. Leaves have a pungent, bitter-sweet, aniseed taste, and can be used in salads or soups. They have a very high

Vitamin C content. The seed is also used for flavouring. Sow seed in spring direct into garden position, preferably in full sun. Germination takes 21–25 days at 15–20°C.



Horseradish
A perennial with large, spinach-like leaves and a long, white tap root, which has a pungent, peppery flavour. Grow from root cuttings in early spring. Will spread rapidly and may have to be controlled. The roots are grated and used in sauces and dressings.



Lavender
A traditional herb which is a hardy perennial plant and widely grown. There are many different species, all of which enjoy full sunlight and dry conditions. The crushed leaves have a delightful lemon fragrance and are used in sauces and with poultry, fish and pork dishes. Cut flower spikes as the buds begin to open and dry in a cool shady place.



Marjoram
A perennial herb growing to 30cm high. Plants need full sun and moist conditions. The leaves and small white flowers are used fresh or dried for flavouring meat dishes. They have a spicy, sweet flavour. Propagate by cuttings in spring, or seed sown in spring. Seed germinates in 8–14

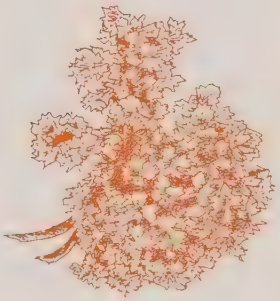
days at 15°C. Plant in full sun in a well drained soil. Replace plants every three to four years before they become woody.



Mint
A rambling perennial which spreads by means of rhizomes. It is often a good idea to contain them in a large pot or tub. There are many different types of mint, including apple mint, peppermint, rust-free mint, spearmint. The leaves have a strong aroma and are used in sauces, jellies and garnish. The leaves are picked in sprigs and finely chopped. Partial shade gives the best results. Mint may need watering in dry periods. Best grown from cuttings. Alternatively sow seed in spring. Germination takes 12–15 days at 15°C.



Parsley
The best known of all herbs, parsley is a biennial and dies after flowering and so should be sown each spring. Parsley grows well in sun or semi-shade, but prefers highly fertile soils and damp conditions. The leaves can be used fresh as a garnish or dried for flavouring salads, vegetables, meat, stews, soups and egg dishes. The two common varieties are curled parsley and plain leafed parsley. Seeds germinate in 14–21 days at 15°C. Darkness will aid germination.



Rosemary
An attractive perennial shrub growing up to 1 metre high with dark, needle-like leaves and lavender blue flowers. There are upright and trailing varieties available. Grows well in sun or semi-shade but soil must be well drained. Suitable for growing in large pots or tubs. Leaves have a pine-like flavour and are used fresh or dried. Rosemary strikes readily from cuttings.



Sage
A perennial herb growing 60cm high with long grey-green leaves and tall spikes of violet flowers. It is a shrub that prefers light sandy soil, tolerating quite dry conditions. Grow from cuttings or alternatively from seed. Germination takes 14–21 days at 15–20°C.



Summer Savory
An annual herb growing to 30cm high with bronze-green leaves and bluish-pink flowers. Requires full sunlight and a well-drained soil. Suitable for growing in containers. Leaves have a peppery flavour. Grow from seed in spring. Germination takes 10–15 days at 15–20°. Winter or Mountain Savory is a hardy perennial plant.

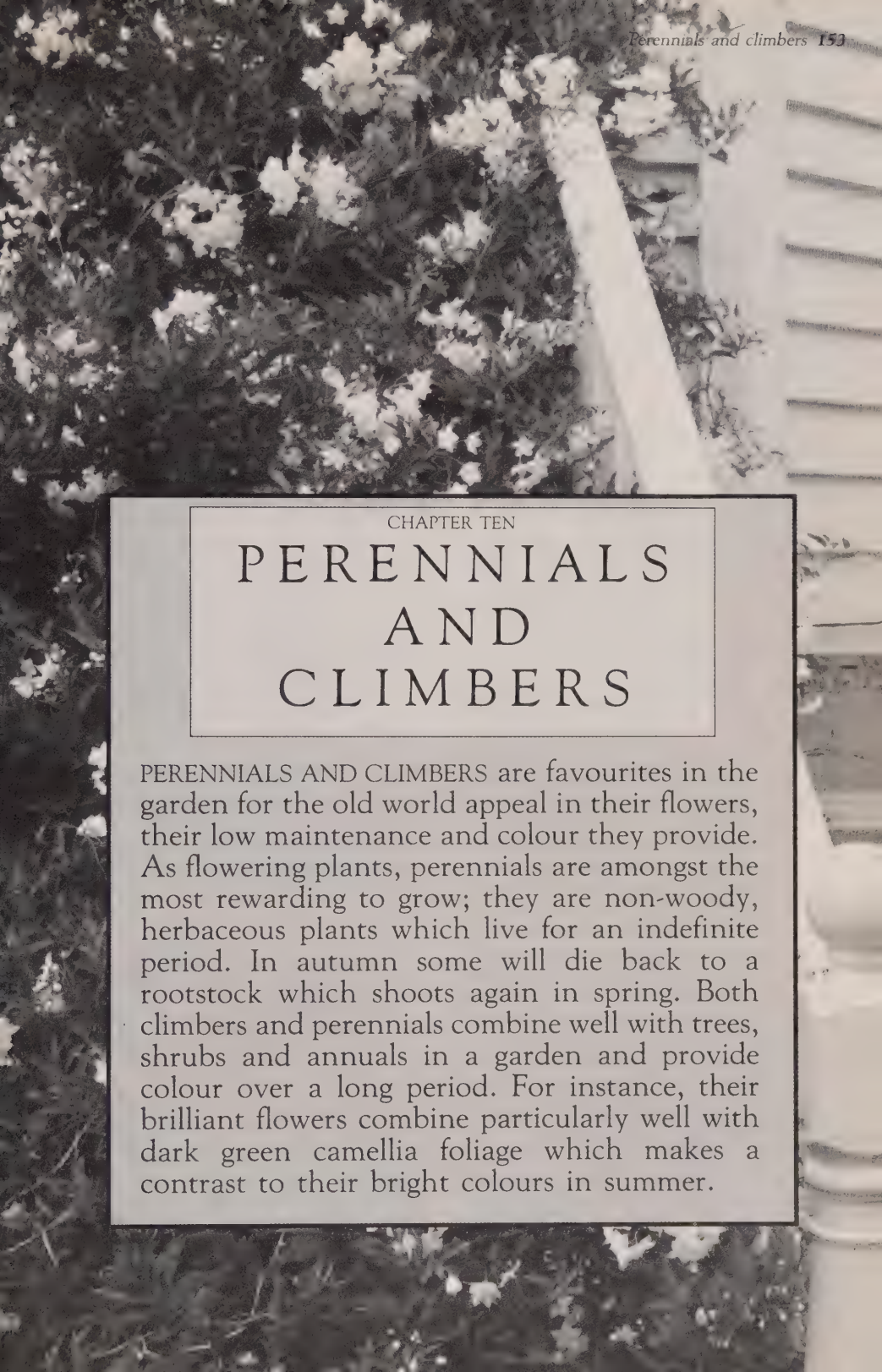


Tarragon
A perennial herb growing up to 90cm high with dark green, pointed leaves with a licorice flavour. Requires full sun growing best in cool climates where it becomes dormant in winter. Sow seed in spring. Germination takes 20–25 days at 15–20°C.



Thyme
A low growing shrub up to 30cm high. A useful plant for ground cover, rockeries, garden borders and suitable for containers. Plants prefer full sunlight and tolerate dry conditions. There are many varieties of thyme including variegated form, lemon thyme, upright and creeping varieties. Grow from cuttings or alternatively raise from seed. Germination takes 21–30 days at 10–15°C.





CHAPTER TEN

PERENNIALS AND CLIMBERS

PERENNIALS AND CLIMBERS are favourites in the garden for the old world appeal in their flowers, their low maintenance and colour they provide. As flowering plants, perennials are amongst the most rewarding to grow; they are non-woody, herbaceous plants which live for an indefinite period. In autumn some will die back to a rootstock which shoots again in spring. Both climbers and perennials combine well with trees, shrubs and annuals in a garden and provide colour over a long period. For instance, their brilliant flowers combine particularly well with dark green camellia foliage which makes a contrast to their bright colours in summer.

USE TALL perennials at the back of a border, e.g. heleniums and michaelmas daisies. Avoid planting strong flower colours alongside each other and separate them by using plants with white flowers, grey or strong green foliage. Use the vibrant yellows, red and oranges with care. Soften by combining with blues and mauves. Grey foliage plants provide winter highlights.

CULTIVATION OF PERENNIALS

THOROUGH INITIAL preparation of the soil will be well rewarded with strong growth and free flowering. The best time to prepare the soil is in the autumn after the first rains when the soil is moist and can be easily worked. Raise poorly drained areas by adding topsoil, organic material (e.g. compost and peat). Mulching over the summer will conserve and help suppress seeds. Set up new plants in the spring when the ground is moist and warm. Stake tall plants to avoid damage from wind. Perennials should be pruned immediately after flowering to keep their habit compact. Slugs and snails will eat tender young plants and the new shoots should be protected with Blitzem or Mesurol slug pellets. Spraying over the summer to control caterpillars is usually necessary. Orthene or Target are suitable. Fungous diseases can be prevented with Saprol and/or Bravo. Alternatively Shield, a combination spray which contains Saprol and Orthene, can be used. Apply in the late winter or early spring each year. A maintenance dressing of Gro-Plus General Garden fertiliser (50g per square metre) can be used. Thinning or dividing perennials is usually necessary when the clumps become overcrowded after 4 or 5 years. The centre of the clumps tend to become old and straggly and the best plants for replanting are on the outside. After lifting clumps dig the area over to aerate. Add compost and or peat and fertiliser before replanting. The perennials listed below are commonly grown by division.

FAVOURITE PERENNIALS



Acanthus (Bear's breech)
Grown for its coarse, glossy leaves and tall flower spikes. Grows best in a moist, rich soil with good drainage but tolerates dry, sandy soils. Prefers shady conditions but tolerates full sun in cool climates. Remove spent flower stalks. The roots are likely to spread a considerable distance, so confine the plants if possible. Snails and slugs can be a problem.



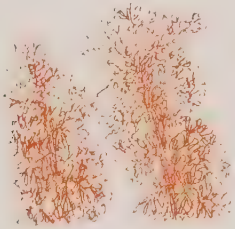
Achillea
This plant has attractive, ferny foliage and tiny flowers which range from white, yellow and rose. The plant is long-lived and does not spread. Prefers a well-drained soil and full sun. Grow in a sheltered position to avoid the need to stake. Propagates easily from divisions.



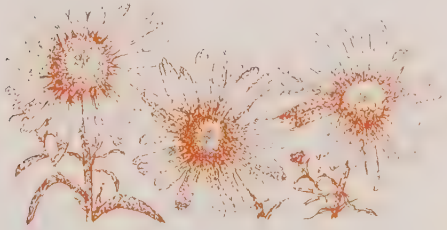
Agapanthus (African Lily)
Evergreen plants with long strap-like leaves and fleshy roots. The ball-shaped clusters of flowers come in blue or white and bloom in summer. A very hardy plant. Excellent for stabilising banks, and tolerant of wet, dry, sun, shade, wind or coastal conditions. There are some interesting dwarf forms suitable for edging. Propagate by division.



Armeria (Thrift)
A hardy evergreen which forms dense cushions of grass-like foliage. The rounded flowers come in a range of colours from white and pink to deep rose. An excellent plant for edging, rock gardens, cut flowers, beds and borders. Requires good draining soil, preferring sand. Plant in full sun. Tolerates wind and salt spray. Remove faded flowers before they set seed, to prolong flowering. Divide the clumps to rejuvenate.



Artemisia (Wormwood)
Famous for its silver-grey, feathery foliage. Requires good drainage, will not tolerate wet soils in winter. Thrives in sandy soil in full sun. Tolerates heat but not humidity. If rust is a problem, spray with Saprol.

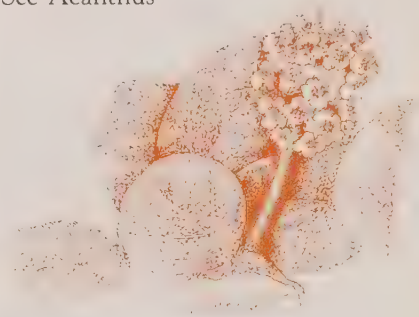


Aster (Michaelmas daisy)
Familiar for their daisy-like flowers produced in late summer and autumn in all shades except orange. Many varieties available in various colours and sizes. Low growing varieties are bushy and prostrate, creating dense carpets of colours. Taller varieties have erect stems, are heavily branched and may be as high as 2 metres. Clumps increase quickly and begin to die in the centre at an early age, necessitating division which is best carried out in spring. A light, moist soil of average fertility is best. Grow in full sun or partial shade in hot areas. Pinch plants in late spring to produce better flowering and denser plants. Tall varieties may need staking for support. If rust or powdery mildew are problems spray with Saprol.



Astilbe (Goat's beard)
Attractive, dark green foliage and frothy plumes of white, pink, lavender or red on arching stems giving a delicate and feathery effect. A favourite perennial for shady, moist locations but also does well in full sun. The clumps gradually expand and plants should be divided every 3 or 4 years. Give generous applications of Gro-Plus General Garden fertiliser each spring and water abundantly. Powdery mildew, slugs and snails may be a problem. Spray with Saprol and lay Blitzem pellets.

Bear's Breech
See Acanthus



Bergenia
A low growing evergreen with large, rounded, cabbage-like leaves and pink or

white flowers. Adaptable to most situations and extremely hardy. Divide in early spring. Protect from snails with Blitzem or Mesurol.



Campanula (Bell flower)
A charming addition to a wild or informal garden. The bell-shaped flowers appear on slender stems. The plant gradually spreads outwards. Divide in early spring. Thrives in well-drained fertile soils in full sun or partial shade. Prefers cool summers. Water regularly. Applications of Orthene may be beneficial in protecting the plants from aphids and thrips.



Carnation
The carnation is one of the most elegant of flowers. Its variety of colour adds beauty to the garden and it makes an excellent cut flower. Carnations belong to the genus Dianthus together with pinks and sweet williams (see Chapter Eight). There are two types, border carnations and perpetual flowering carnations. The latter type is probably the most popular, producing delicate double flowers all year round. Border carnations are double flowered with smooth flat petals and flower once a year. Carnations need a well-drained, light soil with plenty of organic material and a complete fertiliser.

Coreopsis
See Chapter Eight.



Chrysanthemum
A large, well known and extremely versatile group of plants. There are 3 types: annuals which are grown from seed (refer to Chapter Eight), perennials, and the specialised cultivars popular for floral work and exhibition. They can be planted in rock gardens or massed in borders, grown in pots or windowboxes. They are easy to grow and ideal as cut flowers in the home garden and for exhibition showing.

Among the hardy perennials is the well known Shasta daisy, (Chrysanthemum maximum). It produces large, white, daisy-like flowers and grows to a metre high. It flowers in midsummer and prefers a sunny open position but tolerates a range of soils. Plants can be divided in the spring.

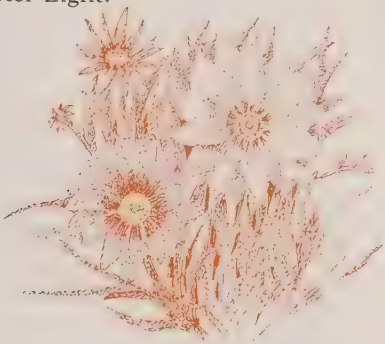
Fever-few (Chrysanthemum parthemium) produces an abundance of small white flowers with yellow centres.

The pyrethrum daisy (Chrysanthemum coccineum) is an excellent cut flower with single or double flowers on long stems in a range of colours from white, lilac, rose and red.

Chrysanthemums grown by gardeners for exhibiton or dazzling garden displays are classified according to their form. Growing them is a specialised hobby and requires detailed attention to planting, staking, fertilising and disbudding. For a guide to growing this type of chrysanthemum, consult a specialist publication. Chrysanthemums are easily propagated from cuttings or by dividing the clumps

which is necessary to keep an ongoing supply of strong, healthy plants. They prefer a free draining soil rich in organic matter.

Delphinium
See Chapter Eight.



Gazania
A member of the daisy family, the gazania is suited to growing in full sun and can survive where nothing else will. Suitable for holding dry banks together and thrives in coastal and sandy soils. There are a range of hybrids available in pinks, orange, red, maroon and purple. Has a compact branching habit and provides a mass of colourful flower heads from early spring to midsummer. Propagate by seed or division.

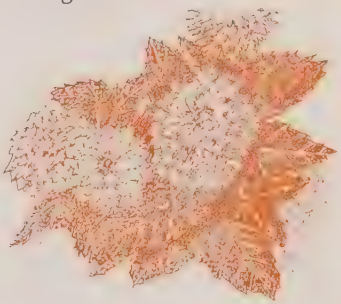


Geranium
The hardy and durable geranium does well in a wide variety of soils but performs best in fertile, well-drained soils in full sun. They are propagated easily from cuttings taken in autumn when the soft, young tip roots easily. Prune back each spring to promote a fresh new growth which will flower profusely. Without pruning the plants become very straggly and flower only sparsely.

Gerbera
See Chapter Eight.

Goat's beard
See Astilbe.

Gypsophila
See Chapter Eight.



Heliopsis
These yellow-gold flowers are produced in abundance over a long summer season. The flowers may be single, semi-double, or double. Best in moist well drained soil of average fertility, high in organic matter. Plant in full sun. Water abundantly especially during drought. Rejuvenate by dividing every 3 or 4 years.



Helleborus (Winter Rose)
An evergreen perennial that flowers in winter with large white flowers, sometimes with a flush of pink. Useful in shady spots under the canopy of deciduous trees. The clumps of foliage expand slowly and are long-lived. Prefers a well-drained, moist soil requiring shade in summer and partial sun in winter. Keep evenly moist and do not allow to dry out. Prefers cold districts. The plants should be left undisturbed. To propagate, divide in early spring.



Hosta
Lush, bold foliage is the outstanding feature of this plant. The large, heart-shaped leaves fan out from a central clump. Ideal for the shady areas. Tolerates a wide range of soils but best in a well-drained, moist soil high in organic matter.

Impatiens
See Chapter Eight.



Kniphofia (Torch Lily, Red Hot Poker)
Produces mounds of grasslike leaves and erect spikes of brilliant flowers in flaming red, orange or yellow. Many hybrids are available. The soil must be well drained. Grow in a sunny but sheltered position as the tall spikes may be damaged in the wind. Division may be needed every fourth or fifth year. Useful in hot, dry positions.

Michaelmas Daisy
See Aster.



Peony Rose
A huge, fragrant flower in an array of colours and forms. The foliage is also glossy and attractive. Peonies need a rich, well-drained soil with plenty of organic matter. Full sun is best although light shade is tolerated. Prefers a cool climate.

Phlox
See Chapter Eight.

Polyanthus
See Chapter Eight.

Red Hot Poker
See Kniphofia.

Rudbeckia
See Chapter Eight.



Salvia
Perennial salvia has a loose, upright habit of growth and distinctive, tubular flowers. Violet flower spikes and grey-green foliage last throughout the season. A long-lived plant if conditions are favourable, and particularly if the soil is well drained. Plant in full sun. Will withstand heat, drought and poor soil, but wet soil in winter is usually fatal. Remove spent flowers to prolong flowering.

Scabiosa
See Chapter Eight.

Thrift
See Armeria.

Torch Lily
See Kniphofia.



Violets
Perennial violets are popular old-world flowers for edging and shady ground-cover. The dainty, lilac or mauve flowers appear in spring, contrasting attractively with the dark foliage. They have their own charm, producing smaller blooms than those of the pansy or viola.

Mulch in spring and keep well watered

in dry weather. Pick the dead heads out regularly. Lift and divide clumps in autumn every 2–3 years.

Winter Rose
See Helleborus.

Wormwood
See Artemisia.

CLIMBERS

CLIMBING PLANTS have many uses in the garden. They can be used to provide masses of foliage as a background to shrubs and annuals, attractive and fragrant flowers, a cover for bare walls, fences, tree-stumps or dead trees. They add privacy to a corner of the garden.

Deciduous climbers grown over a trellis or pergola are ideal for providing shade in summer and letting sun through in winter. A true climber grows towards the light by various clinging methods. Some employ aerial roots, as is the case with ficus and ivies. Threadlike tendrils of passionfruit and other vines coil round trellises. Some climbers such as jasmine twine around a support. The sucker discs of plants like virginia creeper cling to walls. Others like bougainvillea and climbing roses have hooks or barbs on their stems. Other plants can be trained to climb, but will need tying.

A SELECTION OF CLIMBERS



Akebia
A strong-growing, long, thin, twining vine. Fragrant brownish goblet-shaped flowers. Usually deciduous in cold climates. Flowers in spring, needs pruning in winter.

Boston Ivy
See Virginia Creeper.



Bougainvillea
A group of spectacular climbers and ramblers. Frost tender and grown successfully in warm climates only. Tolerant of drought conditions and produce vivid displays in late spring and summer. Require hard pruning. Can be trained as shrubs. Colours include brilliant purple, red, orange, white and bi-colours.



Clematis
Hardy climbers of which there are over 250 known species. Most are deciduous and prefer a cool, moist, shady spot which allows the vine to climb toward the sun. The large flowering hybrids are particularly beautiful. Prune spring-flowering clematis immediately after flowering. Summer-flowering clematis should be pruned early in spring. Cut back to within a few centimetres from previous year's growth.



Ficus (Climbing Fig)
A well-known evergreen climber that clings by aerial roots to rough surfaces. Used to cover low walls, banks, fences, steps. The thick leaves will completely hide or cover bricks or wooden walls. Cut back every few years to prevent long, stray growth. Prefers a rich moist soil. Needs regular trimming.



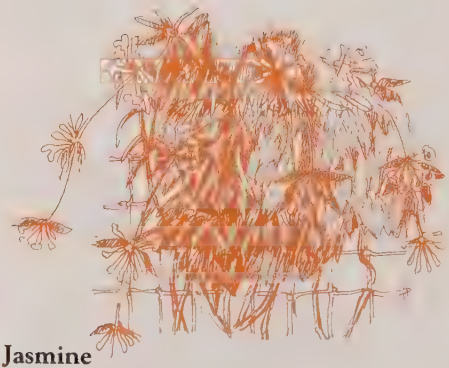
Gelsemium (Carolina jasmine)
A climbing evergreen with fragrant, yellow, trumpet flowers in spring and summer. Suits any average garden soil. Prefers full sun or light shade. Water generously during summer.



Hardenbergia
A fast-growing, twining climber flowering in late winter producing small, violet-blue, pea-like flowers. White and pink varieties are also available. Easy to grow. Plant in a sunny position in a well-drained soil. Will tolerate heavy soils and semi-shade.



Hedera (Ivy)
A vigorous climber covering walls, fences and tree stumps with aerial roots. Often used as a ground cover under trees or on banks. There are many different types of ivy with green and variegated forms available. Easy to grow in any average garden soil but requires plenty of moisture. Grow in full sun or partial shade.



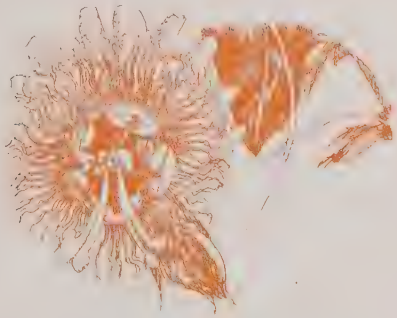
Jasmine
A large group of quick-growing climbing and trailing plants. Jasmine grows in an average soil either in sun or shade and adapts itself to wet or dry conditions. In summer clusters of white, trumpet-shaped flowers appear. It is not completely hardy and will not survive in cold, exposed sites. Remove dead or unwanted stems after flowering.



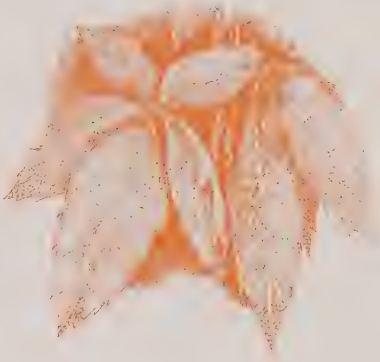
Lonicera (Honeysuckle)
Honeysuckle produces masses of colourful, tubular flowers over a long period. Grows in partial shade or sun. The flowers have a spicy fragrance. Tends to be untidy and is better suited to clamber over arches or fences or up trees rather than being clipped and tied into a neat shape. Remove unwanted stems after flowering. It is a rampant grower and needs a strong support for the heavy stems and foliage.



Mandevilla
Beautiful, easy-growing climber producing pink, trumpet-shaped flowers through summer. Sweetly scented, deciduous.



Passiflora (Passionflower)
There are many beautiful and brilliantly coloured species. Plant in a free-draining soil in full sun. Protection from frost is essential. Prune unwanted growth in spring.

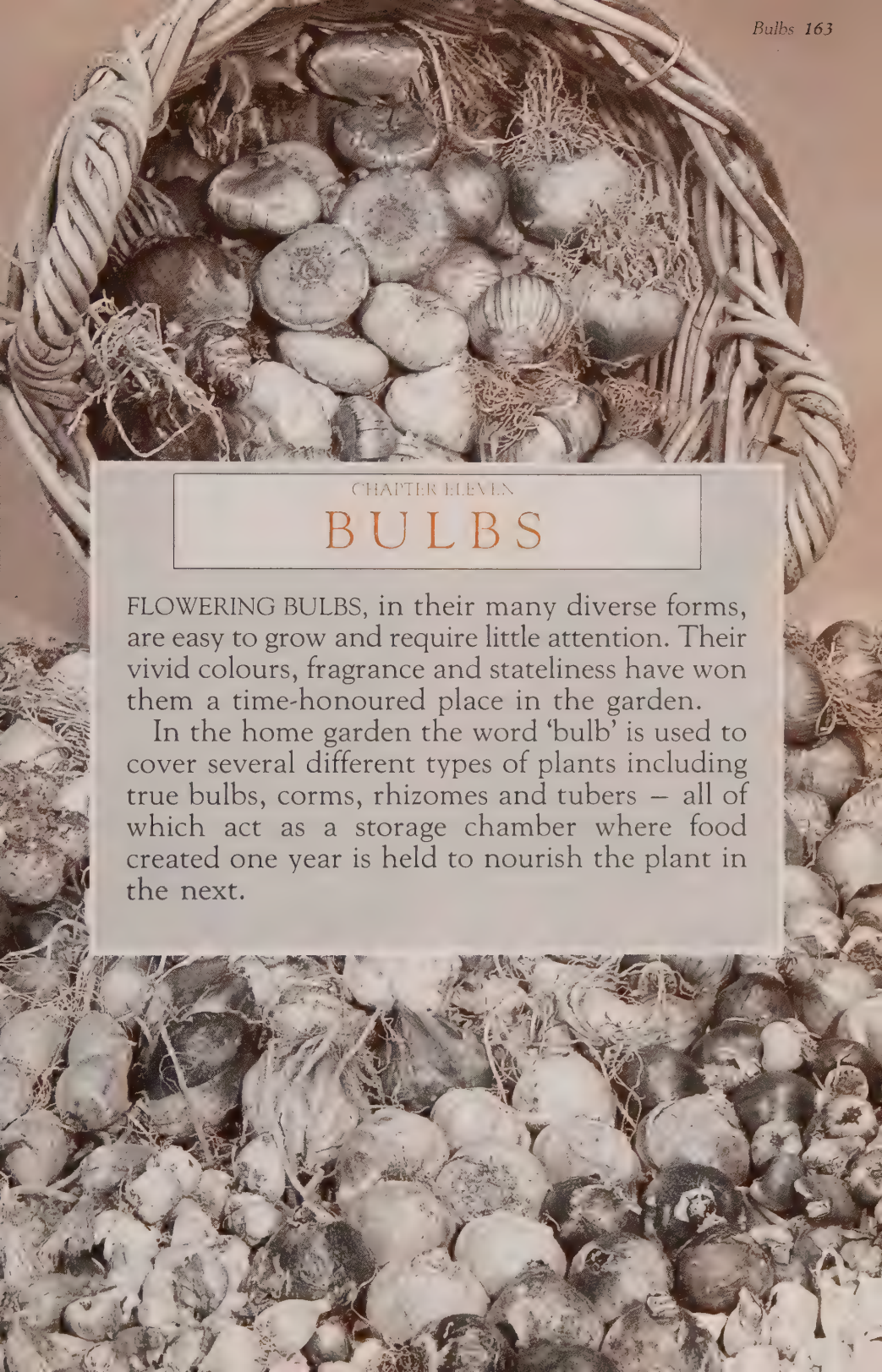


Virginia Creeper (Parthenocissus, Boston Ivy)
A well-known self-clinging plant often seen against brick or concrete walls. Leaves turn bright red in autumn. Deciduous. Remove unwanted growth in early spring. Plant in a fertile, free-draining soil. Thrives in sun or shade.



Wisteria
A deciduous, woody, twining climber. Very hardy and produces magnificent lavender-blue flowers in spring. There are various forms in shades of purple and white. The leaves are light green and have a ferny effect. Long-lived, hardy and best suited to a rich, well-drained soil in full sun. Prune by cutting current year's growth to about 20cm.





CHAPTER ELEVEN

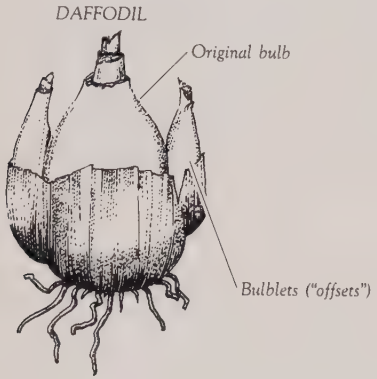
BULBS

FLOWERING BULBS, in their many diverse forms, are easy to grow and require little attention. Their vivid colours, fragrance and stateliness have won them a time-honoured place in the garden.

In the home garden the word 'bulb' is used to cover several different types of plants including true bulbs, corms, rhizomes and tubers – all of which act as a storage chamber where food created one year is held to nourish the plant in the next.

TRUE BULBS

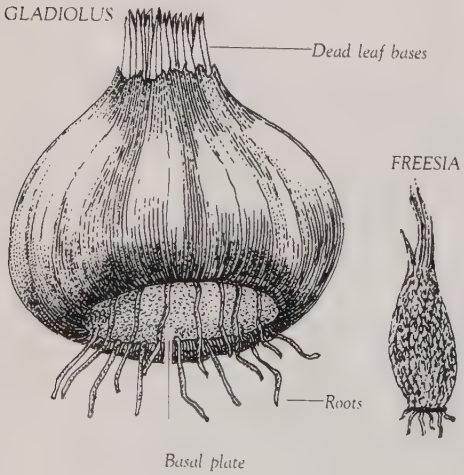
TRUE BULBS have an onion-like structure with layers of fleshy leaves or scales closely folded on each other. These scales contain reserves of plant food for the growing bulb. In the centre of the bulb and protected by the scales are the embryonic leaves and flowers. Examples of true bulbs are daffodil, jonquil, hyacinth, tulip and lilium.



CORMS

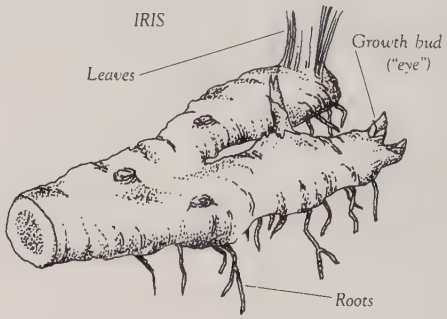
A CORM is a shortened, swollen stem of storage tissue, generally covered with layers of husklike material. During its growing season a new corm forms on top of the old, which withers and dies.

Multiplication is from small corms (cormlets) which form around the base of the new corm. Examples of corms include crocus, freesia, gladioli, ixias.



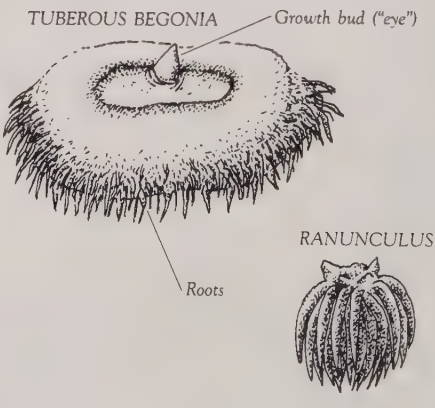
RHIZOMES

RHIZOMES ARE underground stems, usually thick and swollen, containing storage tissue. Roots, leaves and flowering stems develop from nodes or joints along the underground stems. Examples are iris and lily of the valley.



TUBERS

TUBERS CAN be either swollen stems or swollen roots for storage. New shoots arise from axillary or stem tubers or from buds on a short piece of stem on root tubers. Examples are cyclamen, dahlia and tuberous begonia.



CULTURE

BULBS HAVE many uses in the garden, planted in groups of individual species, in specific beds, in borders, under other plants. Bulbs adapt to many types of soil but a light, well-drained, sandy loam is best. Loosen the soil to a depth

of at least 30cm, incorporating peat and organic matter. A dressing of superphosphate or Bulb Food should be applied when preparing the soil at a rate of 200g per square metre. Mix well with soil to avoid direct contact between fertiliser and the bulbs. Once bulbs have germinated and become established, a further application of fertiliser can be applied at a rate of 100g per square metre. Most will respond to liquid fertiliser when flower buds appear.

Depth of planting varies with the size of the bulb but a general rule is to plant at a depth equal to twice the diameter of the bulb. In heavy soils incorporate peat or sand within the planting zone to ensure good drainage.

It is important to let the leaves of bulbs die down naturally each year after flowering, so that stored food reserves in the bulb are replenished for next year's growth.

BULBS IN CONTAINERS

MANY BULBS can be grown to perfection in tubs, pots or troughs which can be moved about the garden, terrace or balcony. Small containers can be brought indoors when the plants flower. All the stronger growing daffodils, hyacinths, lachenalias, tulips and freesias make splendid pot plants for spring flowering while tuberous begonias, asiatic and mid-century hybrid liliums and hippaestrums are most suited for summer flowering. Use one to twelve bulbs according to variety, size of bulbs and container to be used.

Containers, which must have drainage holes, should be at least 10cm deep to allow for good root growth. Place broken crocks, coal or charcoal in the base of the pot. Fill the pot with potting mix. After planting, water well and place the pots in a cool shady place until leaves emerge and then move into a sunny, sheltered position. Keep the mix moist at all times but do not overwater. If plants are slow to develop, feed with Lush when buds appear. It is not advisable to use the same bulbs more than once for potting and when dormant, bulbs should be planted out in the garden.

CULTIVATION NOTES

Allium

Few people realise the beauty and decorative qualities of some of the species of alliums.

Related to onions, garlic and chives, unfortunately some carry the same pungent odour, which has some effect on their popularity. As a garden flower, they are quite unsurpassed and are delightful subjects for the rockery as well as the herbaceous border. Some species grow 1–1.5 metres tall.

Plant bulbs 5–10cm deep and 20–30cm apart in autumn. They prefer sandy, well drained soils, and regular watering during the growth and flowering period. As the foliage begins to yellow, withhold water.



Alstroemeria

A tuberous plant that produces red, pink and yellow and some spotted or streaked flowers in contrasting colours. Plant bulbs 30cm apart and 15cm deep in a good garden loam. They grow 75cm high. Leave undisturbed for several years. Increase of alstroemerias is usually by division of clumps which should be done in autumn to allow plants to make new roots before winter. Collapse of roots due to damage when dividing clumps, usually follows late or winter plantings, particularly in heavy soils.

An excellent longlasting cut flower, blooming between spring and summer.



Amaryllis

There are two commonly cultivated types of Amaryllis. The first is:

Belladonna Lily or Naked Lady: the foliage appears in spring and lasts through the summer, when it withers. The trumpet-shaped flowers follow on leafless brown stalks – hence the name naked lady. Plant bulbs in early spring in full sunlight. Feed and water liberally when foliage appears.

Hippeastrum, the second amaryllis is a very striking and satisfying plant to grow. The massive lily-like trumpet-shaped flowers are a superb decoration and make long-lasting cut flowers. In warm climates they can be planted outdoors, but they make an excellent house plant. Clusters of three to six huge flowers are borne on stems up to 50–60cm high. The strap-like leaves emerge after the flowers. An extensive hybridisation programme in Holland has resulted in a large number of giant hybrids in vivid colours being available.

The bulbs should be potted in late autumn or early spring in a pot which has at least 5cm of space on each side of the bulb. Take care to spread the roots well and fill the pot up with mix leaving approximately half of the bulb exposed. Place in a position where they get several hours of bright indirect sun each day. Keep evenly moist and feed weekly with Lush. The flower stalk usually appears before the green strap-like leaves. Plants should be moved to a cool position to encourage the flowers to last longer. After flowering cut the stalk to 2–3cm from the bulb. Keep the plant growing, allowing the foliage to develop. The leaves will yellow and wither in late summer and the bulb should be left to rest and watering should cease. About six weeks before the following spring, repot in fresh potting mix and place in a well-lit position and water well. By planting at two- to three-week intervals from October onwards, it is possible to have giant blooms through December and January.



Anemone and Ranunculus

Anemones and ranunculus are unrivalled for ease of cultivation, variety of colour and long-lasting beauty. If planted in late autumn they will produce rich, glowing colours for several months of spring.

Improved hybrid strains of ranunculus are available, such as Tecolote and Hadeco. These have been bred for their multi-coloured double and semi-double blooms in shades of yellow, orange, crimson, pink, purple and white. Tecolote tend more towards pastel shades while the Hadeco strains have strong, intense colours. Anemones are available in Californian and Dutch-grown hybrid strains.

To ensure success, start bulbs in shallow trays filled with potting or seed raising mix, peat or untreated sawdust. Bulbs should be planted one to two centimetres deep and 15 centimetres apart – anemones with the point down and ranunculus with the claws down. Trays should be placed in a cool shady position and kept moist, but not wet. Anemones and ranunculus are susceptible to soil fungus diseases. As a preventative measure, dust bulbs with a fungicide. These diseases are most prevalent in warm, moist conditions and over-watering should be avoided. Bulbs will germinate in five to ten days in trays. They can be planted out three to four weeks later. Anemones and ranunculus prefer a light, rich soil sheltered from the wind. The plants should be spaced 15–20cm apart.

After flowering in spring they will gradually mature and die down when they may be dug up and kept in a dry, airy situation until the next planting. In

most circumstances they are treated as annuals and new bulbs are planted each year.



Autumn Crocus
See Colchicum.

Babiana
Babianas have violet blue and mauve flowers similar in shape to freesias. The plants require full sun and will tolerate fairly dry conditions. Plant in late summer 5cm deep and 7cm apart. They grow to 20cm high.

Babianas are particularly attractive planted in clumps in the garden or as a border along the side of a path or driveway. Bulbs can be left undisturbed for several years or lifted annually if required.



Begonia (Tuberous)
The tuberous begonia is a magnificent plant and can provide bright colour for shady spots in the garden. The flowers have a delicacy and perfection not found in many other plants. They can be grown inside the home, in glasshouses, patios, porches and outside in warm sheltered conditions.

The main categories are Double Camellia, Double Fringed, Picotee, Nonstop, and Pendula. The latter is used mainly for growing in baskets for hanging or in shaded areas in garden or window boxes where the pendulous growth habit can be seen to full advantage.

New strains, such as Clips, have a dwarf habit and masses of flowers. Harlequin, Bridesmaid and excellent Picotee varieties are becoming available and will add to the already impressive array of begonias.

Tuberous begonias can be grown from seed or tubers. The seed, which is particularly fine, should be sown in early spring. Mix with some dry, fine sand and spread evenly over a container of seed-raising mix.

Do not cover, but press down with a flat, smooth board. When the seedlings are large enough to be handled they should be transferred to pots or boxes. Take care not to damage delicate seedlings with water: partial submersion of the container, allowing the water to soak in from the bottom, is the best method.



Plant tubers in spring when the buds show signs of sprouting. Place in a shallow tray or box with a covering of damp potting mix, peat or sphagnum moss. This will allow the tuber to develop a rooting system. When the plant reaches the four-leaf stage, transfer into small pots. Water regularly to keep soil moist and fertilise weekly with Lush. Repot into larger pots as necessary or plant outdoors.

Spray with Shield to control aphids and powdery mildew, and Mite Killer to prevent attacks by red mite.

Begonias like cool, moist conditions, plenty of light and air circulation. Tubers can be carried over from one season to the next by storing in shallow trays or boxes in a cool, airy situation.

Bluebell
See Scilla.

Brodiaea
Brodiaea produces flowers in large clusters or umbels in late spring and early summer on strong, slender stems. Individual florets are tubular with a fluted base. Colours range from white, yellow, blue and purplish blue, to rose and scarlet. They do best in rich, sandy loam. Bulbs should be planted 5cm deep and 15cm apart. Suitable for borders, clump planting or in rockeries.



Calla lily
The common calla lily, or arum lily, possesses a striking white funnel-shaped flower and is commonly found growing wild alongside streams and in other damp places. Recently a vivid range of *Zantedeschia* hybrids has become available. These coloured callas have been bred in New Zealand and include a number of exciting colours in garden, dwarf (suitable for pots), and cut flower varieties. The foliage, often spotted, is also very attractive.

Coloured callas flower naturally in New Zealand from late spring to summer. They are vigorous, prolific, make excellent potted plants and the cut flowers last 2–3 weeks.

Callas grow well in most areas of New Zealand, but prefer warmer climates.

Plant the bulbs in early spring 5cm deep, 12cm apart in a well drained soil. Raise beds with peat and sand to ensure good drainage. Apply a base dressing of Gro-Plus General Garden fertiliser. Water sparingly until the first leaves unfurl, and then liberally when the plants are in full leaf. Leave plants in the ground for two or three years before lifting to divide bulbs. Store in a dry area before replanting in spring.

Callas are relatively free from pests. The major problem affecting the bulbs is a soft rot (*Erwinia*) which spreads through the plant, especially in wet or heavy soils. Premature collapse of the foliage often indicates its presence.



Camassia
Strong-growing camassia will grow 1–1.5 metres tall producing many flowering spikes in colours ranging from deep blue to white. They are easily grown in free, open soil. Grown from seed, bulbs will reach flowering size in two to three years. Plant bulbs in autumn 7cm deep and 15cm apart.



Canna
Cannas flower profusely from summer through into autumn and are often seen as spectacular displays in public parks or planted as borders. If they are looked after, they will flower up to 6 months, and are very valuable plants for a mass display of colour. They have handsome, broad, green or purplish leaves with flowers in a striking range of colours, on stems up to two metres high. 'Canna' is the latin name for a reed or cane. They are natives of tropical America and Asia and are related to bananas.

Cannas thrive in soil enriched with compost and in a sunny position. In dry periods they require plenty of water. The fleshy roots or rhizomes should be planted during early spring, 10cm deep and 45cm apart. Clumps should be divided every 3 or 4 years. In mild climates they are evergreen, but need cutting back in late autumn to provide new growth. In colder climates it may be safer to lift and store the rhizomes through the winter.

Cannas are very easy to grow. They also make splendid container plants. Whether you choose dwarf or taller varieties, there is a place in every garden for these spectacular, long flowering plants.



Cape Hyacinth
See Galtonia.

Chionodoxa (Glory of the Snow)
This delightful plant is a native of Crete and flowers best in cold climates in early spring. The clumps grow 15cm tall with blue and white or mauve, star-shaped flowers. The plants need full sunlight and good drainage. Once established, they should be left undisturbed for several years. Plant bulbs in autumn 7cm deep and 10cm apart. Chionodoxa are easy to grow and are ideal for naturalising.



Colchicum (Autumn crocus)
Large crocus-like flowers appear in autumn and last several weeks. In spring the plant sends up foliage which lasts until early summer before disappearing. There are over sixty species in the genus, but only two are readily available in New Zealand *C. speciosum* 'Album' – a pure white – and 'The Giant' – a hybrid, deep mauve with a white eye.

Colchicums thrive in cooler climates but can be grown satisfactorily in warmer areas. Bulbs are elongated with dark skins and each bulb will produce up to a dozen flowers. They can come to flower inside without soil or moisture before planting, which makes them particularly attractive, interesting subjects. Plant bulbs in late autumn with the long necks just below the surface of the soil in groups 10cm apart. Increase is from natural division of the bulbs. Easy to grow and ideal for naturalising.



Crocus
One of the earliest, spring-flowering bulbs with small, cup-shaped flowers in purple, blue, lavender, striped lavender, yellow and white. Crocus do best in cooler climates. *Crocus chrysanthus* produces slightly smaller blooms but will tolerate higher temperatures and can be grown in northern areas. These are in a range of colours, many in the bronze shades. Plant bulbs in late summer 10cm apart and 5cm deep in full sun or partial shade. In

warmer norther areas plant 10cm deep, to prolong the life of the bulb. Crocus are an ideal subject for planting in pots or containers.



Cyclamen
See the chapter on Flowers from Seed.

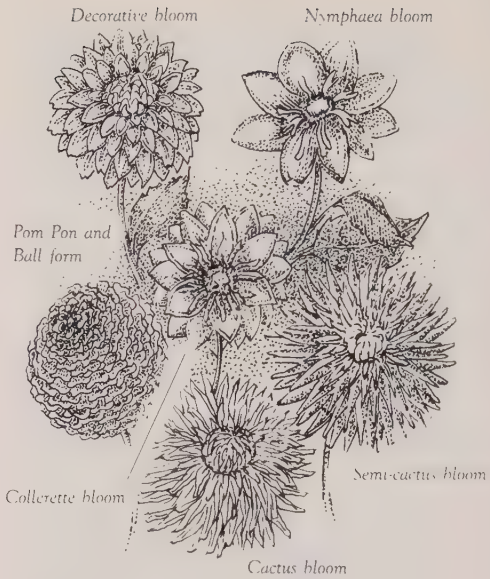
Daffodil
See Narcissus.

Dahlia
Dahlias are easy to grow and there are many different flower shapes and sizes available in a wide range of vibrant colours. Some cultivars are tall, while others are dwarf and are suitable for bedding. Leaf shape, size and colour also vary, a feature which can be utilised in garden design. Leaves can be bronze as well as various shades of green; they can also be finely divided giving the plant a fern-like appearance.

The dahlia is a member of the daisy family and comes from Mexico. It was introduced to Europe at the end of the eighteenth century, rapidly developed by gardeners and very quickly became popular. Today it is grown throughout the world and has a keen following as an exhibition subject, supported by many specialist dahlia societies.

Many new hybrids are being produced in New Zealand. Some of these are world class and are being grown and exhibited in Australia, America, Britain and Japan, as well as throughout New Zealand.

A dahlia bloom is made up of a large number of individual florets. When these

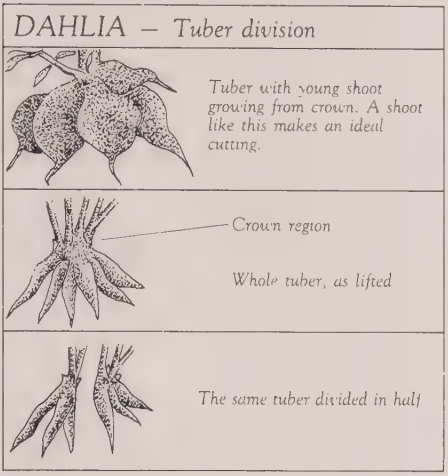


are folded in different ways the shape of the bloom alters, each shape being characteristic of a different type of dahlia.

Plants may be bought from garden centres as tubers, green plants, or as larger flowering plants in planter bags. Each type of plant gives equally good results: tubers can be planted in spring, green plants in spring-summer and flowering plants in summer and autumn.

In windy areas, dahlias need to be staked. They like plenty of water provided the soil is well drained. Apply Gro-Plus General Garden fertiliser before planting and as a side dressing as the plants start to bloom. Dahlias may be attacked by various insects and fungi, mainly in summer, but these are easily controlled by spraying with Shield. Give a regular spray every 3–4 weeks or more frequently if caterpillars become a nuisance. For better blooms the buds either side of the main bud should be removed. Faded and dead blooms should be removed regularly, especially in damp weather. Plants will keep flowering for many months if these simple guidelines are followed. At the end of the season each plant will have formed a tuber which may be lifted and stored in sawdust in a sheltered spot, and replanted the following spring. A dahlia tuber is a root tuber and has its buds restricted to

the area called the crown where the old stems join the swollen roots. These buds are clearly visible when a plant is lifted.



Tubers are best divided at this time because later, when the tuber dries, they are not easy to see and can be easily damaged. Alternatively the tuber can be left until the spring, when the buds start into active growth and are again clearly visible.

Young shoots can be taken off tubers and grown as cuttings. Dahlias can also be grown from seed which is interesting as it is possible to obtain unusual variations in colours and flowers.

Erythronium (Dog's Tooth violet)
The Erythronium gets its common name from the shape of the bulb. The delicate flower is purple or rose. The hardy bulbs resent dry conditions during the growing season and thrive best in cool shady conditions in the North Island and warmer parts of the South Island. They prefer a soil rich in organic matter (compost, peat etc) enriched with Gro-Plus Bulb Food.

There are several known species in existence but only two of these are available commercially.

Erythronium tuolumensis is a pure golden yellow that produces two to eight flowers on 30cm stems. Bulbs should be left undisturbed for two to three years to allow natural increase.

E.X 'White Beauty' is very easily grown and multiplies well. The pure white, marbled flowers, each have a distinct central golden ring. Foliage is mottled. Bulbs are very brittle and should be handled with care. They deteriorate quickly if left out of the ground and allowed to dry. If not planted immediately, bulbs must be stored in slightly damp sawdust, peat or sand. Plant in autumn 5cm deep and 15cm apart, for spring flowering.



Freesias
Freesias are popular spring flowering bulbs which are highly prized for their delightful perfume. They are also an excellent cut flower.

Freesias are available in many beautiful colours, bronze, gold, yellow, white, rose, mauve, purple, blue, orange and red, in single and double varieties. As a result of intensive hybridising, freesia flowers now have more florets per head and are larger in size.

Freesias grow best in a sunny position. They need a friable, well drained soil which is not too rich. Apply a dressing of Gro-Plus Bulb Food during soil preparation. The plants are suitable for massing in beds or can be used in attractive clumps or in pots. Freesias can be left in their permanent positon for several years or the bulbs can be lifted after the plants die down, for storing and replanting. Plant in autumn 5cm deep and 10cm apart.



Fritillaria
These attractive members of the lily family grow best in cool climates. There are several different varieties available, the most well known being *Fritillaria imperialis* 'Crown Imperial'. The plants grow to 60cm tall with drooping, bell-shaped flowers in yellow, orange and bronze. Plant in autumn, 10cm deep and 30cm apart. Leave undisturbed unless they become crowded. Most suitable for naturalising in clumps or in rock gardens.



Galtonia (Cape Hyacinth)
There are three species belonging to this genus. The best known and most attractive is *Galtonia candicans* which produces large roundish bulbs.

It flowers in summer on stems up to 2 metres tall with racemes of thirty to fifty fragrant, pure white bells. Plant bulbs in spring 10cm deep and 20cm apart. Bulbs can be left undisturbed for several years, and will increase slowly from divisions, usually growing larger each year instead of multiplying.



Gladioli
Gladioli are among the most important of summer flowers. They come in a wide variety of colours from pale pastel shades to deep rich golds and reds. The thin, tall flower spikes make choice, long-lasting cut flower specimens and add a bold splash of colour when grown in groups. Some of the newer cultivars in the large flowered types are prized for their ruffled florets and vivid colours.

Gladioli corms are easy to grow, thriving in any sunny location and in virtually any well drained soil. Ideally soil should be deep, fertile and free. Before planting apply a heavy application of a balanced fertiliser, e.g. Gro-Plus General Garden fertiliser.

Gladioli take from 3 to 3.5 months from the time of planting to flowering. By planting at intervals through the winter and spring you will have a display of flowers extending over the summer months. In warm districts the intense heat of midsummer will scorch the blooms so flowering over this period should, if possible, be avoided.



Plant corms 10cm deep and 20cm apart. Place in groups or pockets, rather than straight lines, for a more pleasing effect. Gladioli can also be grown in containers. A 5 litre tub or trough will support 6 corms.

After planting, new leaves appear on the surface in 3–4 weeks, but this depends on soil temperature and time of planting. Keep plants well watered throughout the growing period. Mulching with moist peat is helpful and keeps weeds down. The most critical period of growth is when flower stalks are forming, as new corms are developing underground at the same time. Applications of

Lush when watering at this stage will be beneficial.

Staking will be necessary to prevent wind damage. Thrips are a common pest: these tiny insects cause the florets to become deformed and mottled and the leaves streaked. Applications of Orthene or Target every 2–3 weeks will keep them in check and prevent damage.

Virus infections can also occur. The symptoms do not show up until flowering, when flowers develop streaks and broken colour. It is important to isolate any virus infected plants as early as possible to prevent infection of healthy plants.

Blooms should be cut just as the lower flower opens and placed in water and stored in a cool place before arranging. Almost every bud will open and a much finer spike or flower will be obtained than if left on the plant.

The leaves are necessary for the formation of new corms for next season's flowering and should not be removed. When foliage browns 4–6 weeks after flowering, corms are ready for lifting. At this stage the foliage should be removed to within 15cm of corm. Place in trays in a cool shady position. Very small corms will take two seasons to flower.

Gloriosa
Gloriosa is a member of the lily family. It is a climber, growing 2–3 metres tall with orange or red trumpet-shaped flowers in summer. It supports itself by attaching its leaf-tipped tendrils to a support. The plants prefer a warm sunny position but will tolerate semi-shade. The offsets must be carefully handled when removing from the parent bulb as they are very brittle and easily damaged. Plant offsets during winter and early spring 3cm deep and 30cm apart.



Glory of the Snow
See Chionodoxa.

Gloxinia
Gloxinia is a spectacular tuberous plant, best grown in pots indoors protected from wind and rain and needing ample moisture and even temperatures (about 20°C). The plant has large, oval furry leaves and bell-shaped flowers of velvety texture. These come in shades of cream, pink, red, blue and purple, many being spotted or with contrasting edges or throats. Plant tubers in winter and spring with the top of the tuber at soil level. When flowering is finished in autumn, withhold water and allow the plant to die back. Store tubers in a cool dry place until they show signs of regrowth. At this stage they should be repotted.



Golden Lily of the Valley
See Sandersonia.

Hermodactylus (Snake Head Iris)
Hermodactylus is quite hardy, even in cold climates. It will grow in almost any soil providing it is well drained. Flowers are produced during late winter or early spring. They are an unusual greenish-yellow with a lurid purple tongue. Plant bulbs in early autumn 5cm deep and 10cm apart. The plant grows 30cm high.



Hippaestrum
See Amaryllis.

Hyacinth
Hyacinths have a distinct place in the spring garden with their rich perfume. They are available in various shades of white, cream, yellow, pink, rose, red, light and dark blue. They can be planted in open ground, in pots or bowls or in special hyacinth vases.

'Retarded' hyacinths are those imported from Holland and held back for six months to bring them into line with the Southern Hemisphere seasons. The bulbs arrive in New Zealand in summer. The flower spikes have started to develop in the bulb and as soon as planted grow rapidly. This rapid growth can be controlled by placing the bulbs in the vegetable chiller in the refrigerator (do not freeze) for three to four weeks before planting in autumn. If this is done the bulbs will develop normally.

New Zealand-grown hyacinths are more vigorous and produce better quality flowers, however their availability is not always assured.

Hyacinths prefer sandy, well drained soil that will give a free root run. Bulbs should be planted in late summer 10–15cm deep and 15cm apart. Lift just before foliage dies down. The leaves should remain attached to the bulbs until they fall away naturally. Store in a cool, airy place. Inspect occasionally and discard any that show signs of decay.



Ipheion
Previously known as Triteleia, these plants make a splendid display of star-shaped, lavender blue flowers above soft, green foliage. The plants multiply rapidly and are ideal for naturalising under trees or shrubs. They are also most attractive in borders, rockeries or containers. Plant bulbs in autumn 5cm deep and 7cm apart. They grow to 15cm high.



Iris
Irises are a complex group of plants which can be roughly divided into two major groups, those that grow from rhizomes (bearded) and those from bulbs (beardless).

Best known are the 'flag' or 'bearded' irises which grow from a rhizome. They come in three classes – tall, medium and dwarf – and flower at different times. All have thick rhizomes and broad leaves. Flower colours range from white, through pink, blue, gold, red and many combinations of these various types flower from early spring to midsummer. They are best planted in summer or early autumn in rich soil that contains plenty



of organic matter. Rhizomes should be planted with the roots covered with 10cm of soil and the rhizomes half covered. Space 30cm apart. Do not allow soil to dry out, and water as required for three weeks, after which the plant should be established.

The Dutch and Spanish Irises grow from bulbs. Plant in a sunny, well-drained site in autumn 10cm deep and 15cm apart. The plants form attractive clumps and have flowers in summer in a range of colours including blue, bronze, yellow and white.

Ixia
Native to South Africa, ixias thrive in a sunny, well-drained position and require moisture only during their period of growth in autumn, winter and spring. The flowers have clusters of bell-shaped florets in shades of yellow, gold, pink, orange and cerise. Can be planted in beds, clumps or used for naturalising. Once established they can be left for several years without lifting. Plant bulbs in autumn 7cm deep and 10cm apart. The plant grows to 80cm.



Jacobean Lily
See Sprekelia.

Jonquil
See Narcissus.

Lachenalia
Attractive dwarf plants with pendulous, tubular, waxy flowers. They prefer full sunlight and well drained, friable soil. Most popular varieties in New Zealand are L. pearsonii, yellow with red tips; L. pendula, red; L. 'Scarlet Bloom'. Lachenalias are excellent for borders, clump planting in rockeries, indoor and outdoor pots and baskets. Plants may remain in the ground for several years, or the bulbs can be lifted when foliage dies for replanting the following season. Plant in autumn 7cm deep and 10cm apart. Grows 15–25cm high.



Leucojum (Snowflake)
Delightful, bell-shaped white flowers with a green spot on each petal, blooming in early spring. Leucojom is not often cultivated in gardens as it is considered too common, but it is ideal for naturalising in open fields, under trees or in lawns. Plant bulbs in autumn 7cm deep and 10cm apart.



Lilium
Liliums are among the hardiest of summer bulbs to grow and come in a great variety of form and colour. Many have a delightful fragrance and all can be grown in beds, borders, rockeries,

amongst grass, between evergreens and flowering shrubs, in pots or tubs. As cut flowers they are longlasting. Different varieties will flower from summer through autumn. In recent years there have been many advances with the hybridisation of liliums in different parts of the world, with many new varieties available. Their classification is complex: for detailed information refer to a specialist publication. Generally liliums like a cool moist, semi-shaded position, free from extreme heat or cold. They should be planted in the late autumn as soon as they become dormant. Place bulbs 10–20cm deep according to size and 30–40cm apart. Plant in full sun and mulch the soil surface with peat to keep the roots cool. Liliums planted in open ground grow better if left undisturbed. They make excellent pot plants.



Lily of the Valley
This is one of the sweetest smelling bulbs. The tiny, nodding flowers on delicate stems are widely used in bridal bouquets. Plant bulbs in spring 3cm deep and 10cm apart. They prefer partial shade and moist soil. Lift and divide clumps in autumn.



Muscari (Grape Hyacinth)
With bell-shaped, fragrant flowers, muscari provides a splash of blue in the spring garden. Plant in autumn, 5cm deep, 10cm apart. They grow in full sun or partial shade and suit pots and rock gardens. Flowers will keep for about 5 days when cut. Divide clumps in autumn every 2–3 years.



Naked Lady
See Amaryllis.

Narcissus
This genus embraces a large number of species including daffodils and jonquils. There has been so much cross breeding that confusion exists over names and classifications. For common Narcissi, The Royal Horticultural Society of England uses the following divisions:

Trumpet Daffodils: one flower per stem in yellow and white and bicolours. The trumpet is as long or longer than the petals, e.g. King Alfred.

Large Cupped daffodils: one flower per stem with the trumpet between ⅓ the size or equal to the length of the petals.

Small Cupped daffodils: one flower per stem with the cup less than a third the length of the petals.

Double Narcissus: any number of flowers per stem with more than one layer of petal, i.e. doubles. Grows in combinations of white and yellow.

Jonquils: 2–6 flowers per stem.

Poeticus or Poet's Narcissus: usually one fragrant white flower per stem with a shallow cup of a contrasting colour.

Miscellaneous: those that do not fall into a category, e.g. N. bulbocodium, the petticoat daffodil.

Daffodils are the best known and most adaptable of all spring-flowering bulbs. They grow well in full sun or semi-shade preferring a friable, well-drained soil that has received a dressing of Gro-Plus Bulb Food. For best results, plant early as soon as bulbs are available, usually in late summer. Daffodils have a short dormant

period. Once planted they start developing a rooting system which can take four to five months, and determines the quality of blooms produced and has an effect on flowering in subsequent years.

Daffodils can be grown in almost any garden situation, in beds, clumps, combined with other spring annuals such as alyssum, nemesia, pansy and viola. They are also most attractive in tubs, pots or troughs outdoors or in bowls indoors. They make excellent cut flowers and should be cut when the flowers are almost fully open.

The major pest is the Narcissus Fly common known as bulb fly. These insects cause considerable losses in daffodils, hyacinths, tulips, amaryllis and other similar types of bulbs. They fly on bright sunny days during spring and summer and lay eggs at the base of the leaves. On hatching the larvae, or grub, burrows into the centre of the bulb. Infected bulbs will be light and feel soft. To prevent, foliage should be sprayed with Orthene during spring and summer. As soon as the bulbs die down, the soil should be cultivated so the bulb is covered and not left exposed. Diazinon granules can be applied and worked into the soil.

Infested bulbs can be given hot water treatment immediately after lifting by immersing bulbs in water at 45°C for 45 minutes. Badly infested bulbs should be destroyed.



Nerine (Spider Lily)
Nerines flower in late summer and are noted for their unusual, funnel-shaped, segmented flowers on long stalks. In recent years, the range of colours



available in Nerines has increased dramatically from pure white to shades of pink, cerise and deepest crimson. Some varieties, e.g. Fothergilli major (bright scarlet), are spangled with gold.

The bulbs should be set with the necks above soil level in friable loam. If they are grown in pots, water should be withheld until flower spikes appear, then applied freely throughout the growing season until late spring when the foliage starts to turn yellow. Nerines dislike being disturbed and will produce more blooms once the bulbs become crowded. An excellent cut flower that will last for several days. Plant bulbs with necks above soil, 15cm apart.

Ornithogalum
Ornithogalum provide a supply of long lasting, beautiful flowers for cutting. There are several species of this spring-flowering bulb. The most popular is 'Chincherinchees' which grows 30cm tall with clusters of white, star-shaped flowers. They can be coloured various shades by standing in vegetable dyes. 'Arabs Eyes' has white waxy petals surrounding a black centre and an aromatic fragrance. Plant bulbs in autumn 5–10cm deep and 15cm apart.



Ranunculus
See Anemone.

Romulea
A delightful bulb that thrives in hot, dry conditions and therefore prefers warmer parts of the North Island. Best known variety in New Zealand is *Romulea rosea* which produces numerous rushlike leaves and cerise or rose flowers in spring. Plant bulbs in autumn 5cm deep and 10cm apart. Grows to 25cm high.



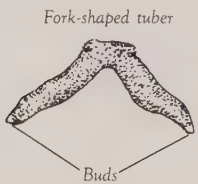
Sandersonia (Golden Lily of the Valley)
Sandersonia is among the flowers that have recently become more fashionable. It is a tuberous plant bearing delicate, orange, bell-shaped flowers on a wiry stem. It is an excellent specimen for the home garden producing leafy stems and golden flowers in December, making an ideal Christmas decoration. Sandersonias are members of the lily family. They have curiously shaped forked tuberous roots and grow best on open, well-drained soil. Incorporate plenty of organic matter, peat and compost. Do not lime the soil.

Shelter from wind is essential as the stems break easily, and ideally grow in full sun.

Tubers should be planted in early spring, placed 10–15cm apart with the claws facing downwards or lying horizontal and deep enough to cover the head with 4cm of soil. The tips of the claws are the growing point and care should be taken not to damage them.

Slugs and snails may be a problem in which case a slug bait should be laid. Aphids or botrytis can be controlled by spraying with Shield.

Sandersonias make excellent cut flowers. The stems should be cut at the base where they emerge from the soil, after the lower two or three buds have opened. Broken stems and leaves should be trimmed and in the autumn the plant should be left to die down. The tubers remain dormant until the following spring. They can be left in the soil or alternatively lifted and stored in damp sand or untreated sawdust. They should not be left to dry out.





Scilla (Bluebell)
Best known as bluebells, these dwarf flowering bulbs thrive under trees and hedges where few other plants will grow. They are also suited to rock garden. Plant bulbs 5cm deep and 10cm apart. To divide lift every 3–4 years as soon as the foliage dies down. Available in blue, rose and white.



Snake Head Iris
See Hermodactylis.

Snowflake
See Leucojum.

Sparaxis
Sparaxis are available in a wide range of colours and are excellent for naturalising in lawns and growing in clumps, in the garden or in borders. They produce masses of bell-shaped flowers.

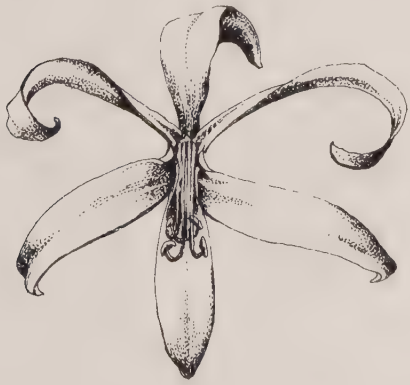
They require a friable, well-drained soil

in a sunny position. Gro-Plus Bulb Food should be added during soil preparation. Sparaxis are susceptible to attack from slugs and snails so it is advisable to spread slug bait around plants during the spring growing period. Plant in autumn, placing bulbs 7cm deep and 10cm apart. Grows 25–30cm high.



Spider Lily
See Nerine.

Sprekelia (Jacobean Lily)
Sprekelia has large crimson, orchid-like blooms borne on naked stems 15–30cm tall. Plants do best in sandy, well-drained soil in a semi-shaded situation. Plant bulbs in winter and early spring with necks of bulbs just above the ground and space 12cm apart.



Tigridea (Tiger flower)
Hardy bulbs that thrive in extremes of both heat and cold. The bright blooms are beautifully marked and spotted. Plant in clumps of six to eight bulbs. An established clump produces masses of flowers, each bloom lasting one day. With fresh blooms opening daily the plant remains very colourful right through the summer. Plant from winter to early spring, placing bulbs 5cm deep and 10cm apart. Grows 60cm high.



Tritonia
Masses of orange, red and pink shades are a feature of tritonias in spring. Cultural requirements are the same as those of sparaxis and freesias. Plant bulbs in autumn 7cm deep and 10cm apart.



Tuberose (Polianthes)
One of the most fragrant of all bulb flowers and used extensively in bridal bouquets. In warm and mild climates, the plants will flower from late spring through to early autumn.

Prepare soil by digging deeply and adding a dressing of general garden fertiliser. Plant bulbs in winter 20cm apart ensuring that the top of the bulb is above ground level. Each bulb blooms only once and to have flowers every year it is necessary to plant out some of the small bulblets that form around the mother bulb. These form flowering-size bulbs during the first year's growth and bloom in the second year.



Tulip

Tulips are one of the most handsome spring flowering bulbs. They have large, beautifully formed, bell-shaped flowers in a wide array of dazzling shades of white, cream, yellow, orange, pink, scarlet, red and deep maroon. The plants do best in cool climates but are adaptable and will perform adequately in warmer areas. Tulips thrive best in light soil that has had a dressing of Gro-Plus Bulb Food and compost plus a dressing of lime if the soil is acid. In cool areas, plant bulbs 15cm deep in light soil and 10cm deep in heavy soil. In warmer northern areas plant 20–30cm deep. It is advisable to place each bulb in a bed of sand to assist with drainage and to keep it away from direct contact with any fertiliser. Plant in autumn for a flowering which follows daffodils in spring.

There are many different forms of tulips available. The most popular are:

Darwin Hybrids: mid-season flowers on stems up to 75cm. Very large flowers.

Darwin Tulips: late flowering on stems up to 70cm. Large oval or egg-shaped flowers.

Cottage Tulips: long oval or egg-shaped flowers, often with pointed segments. Related to tulips found in old English and French gardens. Late flowering.

Parrot Tulips: late flowering and mostly 'sports' of other well known varieties. The petals curl and twist and have splashes of various colours giving a most unusual appearance.

Triumph Tulips: mid-season flowering containing many interesting bi-colour tulips. Stems are robust and up to over 50cm.

There are several Tulip species in New Zealand some of which are available in commercial quantities. Most interesting of these are:

T. eichleri: grows 25cm tall with crimson scarlet flowers and a black and yellow centre.

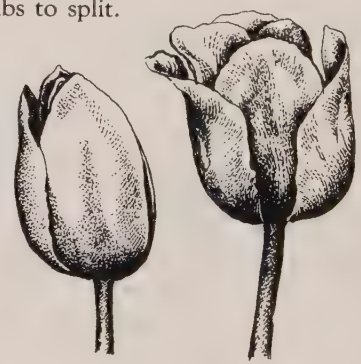
T. fosterana: large, elongated flowers on tall 40cm stems. Used as one of the parents of the New Darwin Hybrids. Early flowering.

T. greigii: late flowering. Attractive leaves with stripes of purple-brown. Large bright scarlet or yellow flowers.

T. kaufmanniana: early flowering 'waterlily' tulip with pointed petals. Dwarf growing 15 to 20cm tall. Creamy-white blooms, tinted yellow with a pink shaded exterior. This species crossed with *T. greigii* has resulted in most of the rock tulips which are excellent for borders and rockeries.

Tulips are generally easy to grow provided they are sprayed regularly to control green aphid which attacks the plant while still in bud causing disfiguration and 'striping'. Aphids can also be responsible for transmitting a virus which will cause streaking or striping of foliage. Control with regular spraying of Orthene or Target.

The next season's flowering depends on the care and storage of bulbs. Allow the foliage to die back naturally, so the food reservoirs in the bulb can be restored. Bulbs should be kept cool. If the soil is likely to heat in summer (particularly in warmer areas), apply a mulch or sow a ground cover of low growing annuals such as pansies, violas or alyssum. If the bulbs are lifted, store in a cool situation with no draughts. Temperatures above 18°C while in the ground will cause the bulbs to split.



Watsonia

A very hardy bulb that produces tall, prolific flower spikes in summer. Flower resembles a gladioli but with smaller blooms. Available in named varieties with colours ranging from white through pink, mauve, salmon and orange to red. Flowers are excellent for cutting. Plant in autumn 7cm deep and 30cm apart.

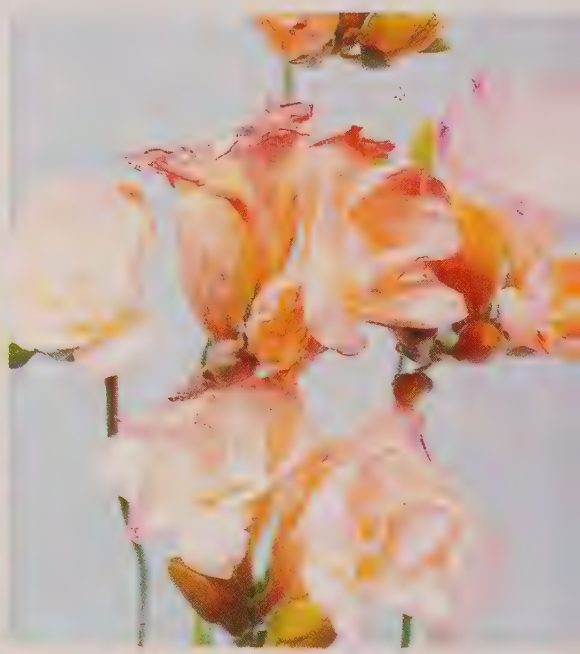
GROWING BULBS

Name	Planting Season	Planting Depth	Distance Apart	Flowering Season
Allium	Autumn	5cm	20cm	Spring
Alstroemeria	Autumn-winter	15cm	30cm	Spring-early summer
Anemone	Autumn	2cm	8cm	Spring
Babiana	Late summer-autumn	5cm	7cm	Spring
Begonia (tuberous)	Spring	Note B	In pots	Summer
Belladonna Lily	Late autumn-winter	Note A	30cm	Summer
Brodiaea	Autumn	5cm	15cm	Late spring
Calla	Winter	10cm	20cm	Summer
Canna	Winter-early spring	5cm	50cm	Summer
Chionodoxa	Autumn	7cm	10cm	Early spring
Colchicum	Late autumn	Note A	10cm	Autumn
Crocus	Autumn	5cm	10cm	Late winter-early spring
Cyclamen	Late summer-autumn	5cm	In pots	Late winter-early spring
Daffodil	Autumn	12cm	10–15cm	Spring
Erythronium	Autumn	5cm	15cm	Spring
Freesia	Autumn	5cm	10cm	Spring
Fritillaria	Autumn	10cm	30cm	Spring
Galtonia	Spring	10cm	20cm	Late summer
Gladiolus	Late winter-spring	10cm	20cm	Summer
Gloriosa	Winter-spring	3cm	30cm	Summer
Gloxinia	Winter-spring	Note B	In pots	Summer
Hippeastrum	Winter	Note B	30–40cm	Late spring
Hyacinth	Autumn	15cm	15cm	Spring
Ipheion	Autumn	5cm	7cm	Spring
Iris, Flag or Bearded	Autumn-winter	Note B	30cm	Late spring
Iris, Dutch and Spanish	Autumn	10cm	15cm	Spring
Ixia	Autumn	7cm	10cm	Spring
Jonquil	Autumn	10cm	10cm	Late winter-early spring
Lachenalia	Autumn	7cm	10cm	Spring
Lilium	Late autumn-winter	10–20cm	30–40cm	Summer
Lily of the valley	Winter	3cm	10cm	Late spring
Muscari	Autumn	5cm	10cm	Spring
Nerine	Winter-early spring	Note B	15cm	Late summer
Ornithogalum	Autumn	7cm	15cm	Spring
Ranunculus	Autumn	3cm	15cm	Spring
Romulea	Autumn	5cm	10cm	Spring
Sandersonia	Spring	5cm	10cm	Summer
Scilla	Autumn	5cm	10cm	Spring
Snowflake	Autumn	7cm	10cm	Spring
Sparaxis	Autumn	7cm	10cm	Spring
Sprekelia	Late winter-spring	Note B	12cm	Summer
Tigridea	Autumn-winter	5cm	10cm	Early summer
Tritonia	Autumn	7cm	10cm	Spring
Tuberose	Autumn-winter	Note A	20cm	Summer
Tulip	Autumn	10–30cm	12cm	Spring
Watsonia	Autumn	7cm	30cm	Spring

Note A: Just cover with soil.
Note B: Plant with top of bulb at soil surface.

SPRING PASTELS











Clockwise from top left: Narcissi (King Alfred), Freesia (Rosalinde), Freesia (Mixed), Crocus (Striped), Ranunculus (Salmon)

SHAPE AND PATTERN













Clockwise from top left: Gladioli (Festival), Amaryllis (Summertime), Tulip (Black Parrot), Dahlia (Natal), Dahlia (Stolze von Berlin), Dahlia (Popular Guest)

SENSATIONAL COLOURINGS







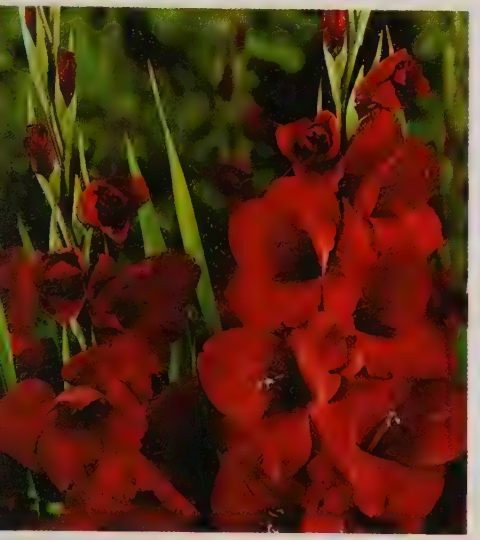


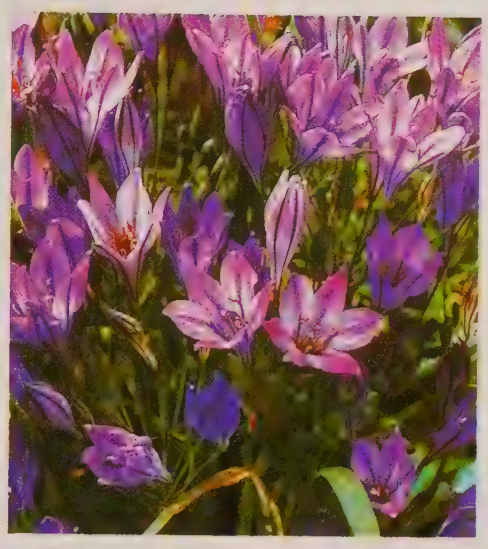


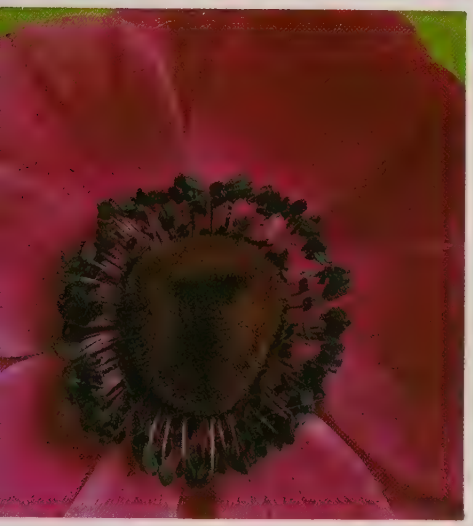


Clockwise from top left: Calla, Lilium (Longiforum), Tulip (Mixed), Ixia (Mixed), Tulip (Dutch Fair), Canna (Tiger Lily)

DEEP TONES









Clockwise from top left: Gladioli (Midnight), Brodiaea (Queen Fabiola), Ranunculus (Rose) Anemone (Sylphide),



Wild Rose



Old Rose



Hybrid Tea Rose

CHAPTER TWELVE

ROSES

ROSES HAVE always been favourites in the garden. No other plant gives so many delightful flowers over such a long season, nor so much variety of form: there are old-fashioned types, modern hybrids, miniatures, bush roses, standards and climbers, and they all offer a superb range of colour, flower form and fragrance which makes them irresistible for garden display or for cut flowers. Roses are extremely adaptable to both climate and soil. In cool, temperate and cold climates roses have successive flushes of blooms during warm weather. In warm, subtropical or tropical climates, they flower all year round. Roses are hardy plants and they will even survive neglect: however, the more care and attention they receive, the more satisfying will be the results with improved plant vigour, and the size and quality of flowers.



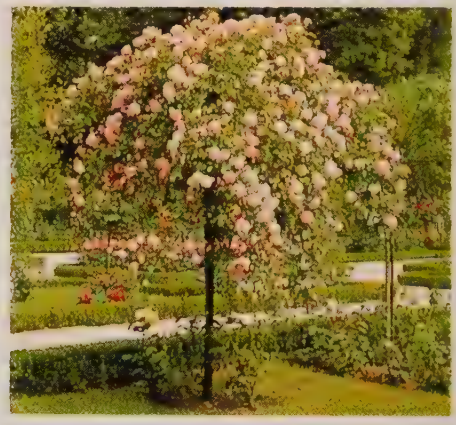
Climbing Roses provide a very attractive cover for pergolas and trellises



Rambling Roses are useful for fanning out on walls and fences



Old Roses add informal charm to a garden



A Weeping Tree Rose which makes a very attractive feature



Hybrid Tea Roses produce most perfectly formed roses



Hybrid Tea Roses come in a range of strikingly vivid colours

PLANTING

ROSES ARE long-lived plants and it is worth spending time and energy in preparing the soil well before planting. Choose an area away from strong prevailing winds, preferably with a warm sunny aspect. Roses can be grown on a range of soils, both sandy and clay, but good drainage is necessary. Heavy clay soils will need to be broken up with plenty of organic matter, raising the planting bed with peat and compost 15–20cm above the surrounding level. Sandy soils which do not hold moisture can be improved with the addition of organic matter.

Prepare soil four to six weeks before planting, breaking up clods and mixing in organic matter to bring the soil to a crumbly condition.

Roses are available potted up in planter bags or containers or as bare-rooted specimens in sawdust. Container-grown roses can be planted year round, and purchasing them in summer when in flower eliminates the risk of incorrect labelling. Bare-rooted plants however, must be planted in winter.

The planting hole should be large enough to allow the roots to spread out naturally without bending. Make a mound of crumbly soil on the bottom of the hole on which to rest the plant and spread the roots. The height of the mound can be adjusted so that the bud union (where the scion is budded onto the rootstock) is slightly above the soil level. Cover the roots with damp, crumbly soil, firming it down well to prevent air pockets forming around the roots. Water gently and then fill the remainder of the hole with soil and water again. Check newly planted roses daily. When the soil is dry, water.

FERTILISER

REGULAR APPLICATION of fertiliser is essential to keep roses healthy and in vigorous growth. Apply Gro-Plus Rose fertiliser (120g per plant) just before new growth begins in the spring. Continue light applications at three-monthly intervals until February. Scatter fertiliser around the base of the plants (but not too close to main stem) and lightly rake into the soil. Water well.

WATERING

ROSES IN sandy soils will require frequent watering. Heavy watering encourages the roots to go deeper so the plant can tolerate longer periods of dryness. This is preferable to frequent light sprinklings which promote shallow roots close to the surface. During spring and summer mulch around the base of the plant to help retain moisture, control weeds and keep the roots cool in the warm weather. A layer of peat 5–8 cm deep is ideal.

DEAD-HEADING ROSES

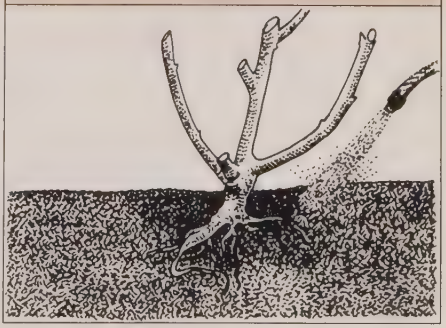
AS FLOWERS start to wither they should be removed from the plant to encourage more flowers. Cut them off with secateurs to a point just above a strong shoot or outward facing bud. Seed heads should not be allowed to develop, unless the hips are wanted for decoration or for seeds.

PRUNING

SUMMER PRUNING is carried out in late January or early February: the plant is tidied up, dead branches or those showing die-back are removed by cutting back to a bud about 5cm below the dead section.

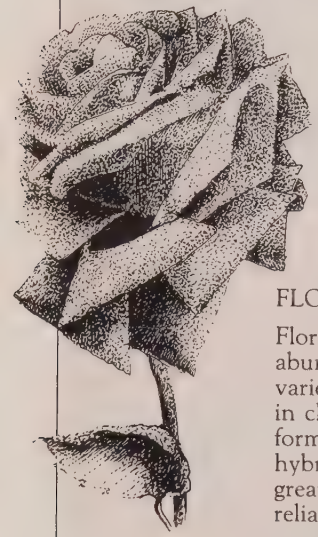
Winter pruning is the main pruning and is usually carried out in July or August when the plants have stopped growing and the canes are mature. Roses

PLANTING A ROSE



TYPES OF ROSES

There are many different types of roses. To observe and learn about roses in your district, visit your local public rose gardens. There you can discover landscape ideas and new introductions and smell and touch rare and unusual varieties. Look for roses you like and observe their growing habits.

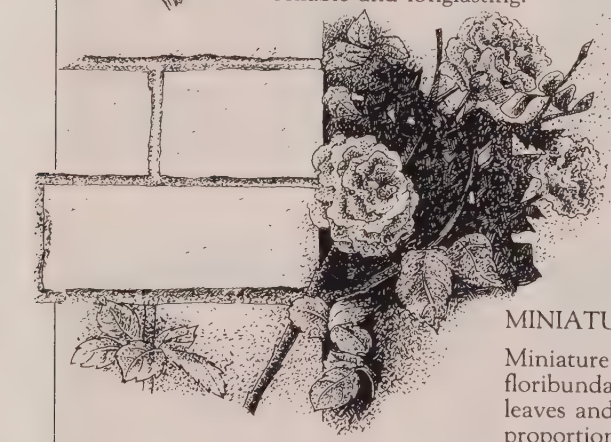


HYBRID TEA ROSES

Hybrid Teas are the most popular type of rose and produce the largest, most perfectly formed flowers in a wide range of colours. They make a good garden display and are beautiful cut flowers.

FLORIBUNDA ROSES

Floribunda roses produce an abundance of flowers in a wide variety of colours, which are borne in clusters or trusses. The flower form is inferior to that of the hybrid teas but they provide a greater display of colour, are reliable and longlasting.



CLIMBERS AND RAMBLERS

There is a vast range of climbing and rambling roses. Ramblers have long pliable stems and bear large trusses of small flowers. They produce several strong stems from their base each year. Climbers make strong stems from any part of the plant and their height potential is far greater than that of ramblers.

MINIATURE ROSES

Miniature roses look like tiny floribundas, but have miniature leaves and flowers in perfect proportion. Under normal conditions they grow between 20–50 cm high and are almost thornless. They are rapidly increasing in popularity due to their novelty and versatility. They can be used for edging, growing in containers, rockeries, window boxes or indoors as temporary houseplants.



SPECIES ROSES

Species roses are those which are grown in their original wild form. They produce single, fine-petalled flowers mainly in spring, followed by a display of decorative berry-like hips in autumn. They are particularly resistant to pests and diseases and require little pruning apart from the removal of soft tips and straggly growth.



SHRUB ROSES

Most shrub roses are hybrids between wild species, hybrid teas and floribundas. They are extremely varied in habit, leaf shape and flower form.

OLD ROSES

Old-fashioned roses encompass a broad group including Species, Old European, Tea and China roses. In recent years there has been a great upsurge in interest in them, due to their good garden qualities. They are particularly fragrant and hardy, and have a delightful, informal nature. Heritage Roses (New Zealand) is a society which attracts enthusiasts and those wanting to obtain and exchange information on old roses.



HIGH HEALTH ROSES

Roses are particularly susceptible to virus diseases, which tend to accumulate with repeated propagation of plant material, so that plants deteriorate. In recent years a special technique of propagating roses has been developed so that they are free from known viruses. They tend to be more expensive than other roses but are likely to display more vigorous and consistent growth and flowering will be clearer and brighter. High Health roses are still susceptible to other pests and diseases and can be infested with viruses at a later stage. However, at the time of propagation they are free of known virus diseases.

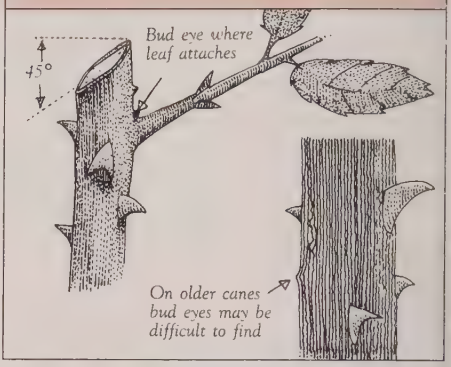
flower on current season's growth. Pruning aims at establishing a framework and encouraging new wood. Dead, diseased, spent wood and weakly growing canes are removed. New strong growth which will flower is encouraged. Use sharp secateurs which make clean cuts without bruising. Bruised, torn wood is likely to become diseased.

Different types of roses are pruned in different ways. The basic aims are the same.

PEST CONTROL

PESTS AND diseases can be prevented with a regular spray programme. Use the first programme below if you want a broad coverage. If you are a rose enthusiast and wish to give particular attention to the garden, the second programme provides the best control.

ROSE PRUNING



PRUNING OF ROSES	
Type	Pruning
Hybrid Teas and Floribunda	Cut out dead, diseased and weak wood, leaving three to five evenly spaced strong canes. Shorten these to about one third, cutting to outside bud and promoting an open, vase-shaped plant.
Bush	Remove weak and damaged wood and laterals that have produced flowers.
Climbers	Prune in late spring, cutting back the lateral flowering shoots to two or three buds.
Ramblers	Cut back flower-bearing stems to ground level immediately after flowering. Tie in new developing stems.
Miniature	Prune after flowering for a quick repeat.
Species	Remove soft tips and straggly growth.

ROSE CONTROL: 1		
Time	Spray	Pest/Disease
Winter	Copper Oxychloride	Scale, mites, aphids, fungus diseases
From leaf bud movement at two weekly intervals	Shield	Black spot, powdery mildew, rust, all insects.
ROSE CONTROL: 2		
Time	Spray	Pest/Disease
Winter	Copper Oxychloride	Scale, mites, aphids, fungus diseases
From leaf bud movement at two weekly intervals	Bravo® + Orthene® alternated with Shield	Downy mildew, black spot, powdery mildew, rust, all insects.

ROSE FIRST AID		
Problem	Symptoms	Remedy
Aphids	Tiny green or pink soft-bodied creatures which cluster on leaves, stems and developing buds. Flower buds may appear deformed and not open properly.	Spray with Orthene® or Shield when aphids first appear.
Mites	Brown, grey or red specks on undersides of leaves which turn grey-brown. Prevalent in dry conditions.	Mavrik.
Scales	Hard grey-white scale-like insects on woody and green stems. Poor growth, pale dehydrated leaves.	Spray with Orthene® in summer and Conqueror oil in winter.
Thrips	Silvery appearance of leaves with distortion and browning of petals. Flower buds deformed and may not open. Flowers have shrivelled petals. To check if buds are infested with thrips, pull bud apart and shake over white paper – tiny yellow or brown insects will be evident if thrips present.	Remove infested buds and blooms. Spray in late spring when weather is warmer and drier at two weekly intervals with Orthene®, Target® or Mavrik.
Black Spot	Circular black spots with fringed margins on the upper leaf surface. Leaves may yellow and then drop prematurely. Flowering may decrease. Stems may also become infected.	Remove flowers, fallen leaves and prunings. From early spring spray every two weeks with Bravo® or Shield. Particularly prevalent in warm humid weather.
Downy Mildew	Maroon blotches usually confined to the veins. Prevalent with warm days and cool nights.	Spray with Bravo®.
Powdery Mildew	New growth appears distorted and a purplish grey colour, turning to white. Encouraged in humid conditions.	Spray with Shield.
Silverleaf	Silvering of leaves, and plants become less thrifty.	Remove and burn all infected wood.
Virus	Small irregular colourless spots on foliage. Stunted growth.	Dispose of infected plants to prevent spread. Purchase High Health plants.
Lack of Fertiliser	Leaves yellowing and/or developing dark purple tones. Leaves are small and drop prematurely. Slow, weak or stunted growth.	Water and fertilise regularly with Gro-Plus Rose fertiliser.



CHAPTER THIRTEEN

TREES, SHRUBS AND HEDGES

TREES AND SHRUBS are essential for good garden design as they provide the permanent framework. Trees have the greatest impact and appeal, becoming a focal point and establishing the garden's proportion and perspective. They enhance buildings, provide colour, introduce sound and movement, and provide wind breaks or barriers to deaden unpleasant noise. Shrubs are versatile plants which provide colour, and background texture. They can ensure privacy, screen unsightly views, provide beautiful foliage, flowers and fragrance or be trimmed into eyecatching shapes. From the hundreds of kinds of trees and shrubs available it is essential to choose those which suit your climate, situation and soil. Plant form, shape and height when mature will dictate their position in the garden.

In this chapter, details are also included on plant training and pruning.

PLANTING

TREES AND shrubs are most commonly sold in containers such as plastic pots and bags. This makes year-round planting possible, although the cooler months of autumn or early spring are the best. Containers of different sizes also offer the choice of small, semi-advanced or advanced specimens.

Balled trees or shrubs are dug up with a ball of soil around their roots and then wrapped in sacking which holds the roots all together. They can be planted at any time but early spring is the preferred season.

Some deciduous trees and shrubs are sold bare-rooted. They are dug up in winter when they are out of leaf and dormant, and must be planted before growth begins in spring.

Keep a watch on each plant to see how much water it requires. It may be necessary to water two or three times a week for the first few weeks if the soil seems dry. A mulch around the base of plant will prevent the soil surface from caking and help conserve moisture. Peat or bark are very suitable. A slow release fertiliser can be used in the hole or fertiliser can be applied to the surface after planting.

Prune as necessary. With container plants this is rarely necessary unless for cosmetic purposes. However with balled and bare-rooted trees and shrubs some pruning is necessary to compensate for the roots that were lost when the plant was dug up. With bare-rooted shrubs up to a third or more of the growth is cut back, resulting in a stronger, better-looking plant.

Transplanting

Transplanting means moving an established tree or shrub to a new position in the garden. Whether it is large or small, this represents some danger to the plant. It is best done in winter when the plant is least active and there is less chance of damage to the root system, which would impair the plant's ability to replace water lost through the leaves.

A month or two before shifting the plant, wrench the roots. This involves

WRENCHING



Cutting the roots with a spade 1–2 months before transplanting will encourage a fibrous root system to develop close to plant.

cutting the roots on one or two sides of the plant with a spade which encourages small fibrous roots to develop close to the plant. A month later cut the roots on the other side of the plant. With the development of many fibrous roots the plant is in much better condition for transplanting.

Dig the new hole and have it prepared and ready for the plant that is being moved.

If necessary prune or tie up low branches to permit easy access to base of the plant. Water thoroughly a few hours before moving. Dig a ditch around the plant and undercut on one side with a spade. Cut gently by chopping with the spade until the root ball begins to loosen. On a large plant it may be necessary to wrap the root ball in polythene or sacking to transport it safely. Small plants can be carried on the end of the spade.

Prune off any long or broken roots before planting. Place the plant in the new hole to the same depth that it was previously planted. Back fill with soil. Water well.

Transplanting should be done in cool, moist weather, as roots will dry out quickly on warm windy days. Prune back as much growth as possible as this reduces water loss from the plant. Watering over the next month is very important and should be done regularly until the root system is well established.

CARE

ONE OF the main advantages of trees and shrubs is that they require little maintenance. However, attention to fertiliser, watering and mulching will help them thrive and maintain good health.

Trees and shrubs are most likely to need nutrients when they are growing rapidly. An application of fertiliser should be made prior to spring and autumn. Spread 50g per square metre of Gro-Plus General Garden fertiliser underneath the drip zone of the outermost leaves of the tree or shrub and water well.

FERTILISING



Spread fertiliser underneath the tree to the edge of the drip zone which extends to the outermost leaves.

Most shrubs require pruning after flowering to promote growth for the next season's flowering wood and to extend their useful life by maintaining a compact habit. Some shrubs flower on current season's growth, others on 1 or 2 year old wood.

SELECTING TREES AND SHRUBS

WITH GARDENS tending to be smaller these days, it is important that you plan carefully to ensure using all space to the best advantage. Trees form the framework of the garden and shrubs the body. You must consider the height to which a tree or shrub grows, whether it is evergreen or deciduous and whether it is grown for foliage, flowers or fruits. A selection of trees and shrubs is given in this chapter. It is by no means comprehensive, but may be a useful guide for the beginner. Further information can be gathered from specialist reference books. Refer also to Chapter Fourteen of this book on New Zealand natives. Garden centres will give valuable information to help you make your selection.

Remember that there are many factors affecting plant growth such as climate, soil conditions, fertilisers, pruning, exposure to wind. The measurements given in the chart are a guide for average conditions, indicating the size a plant should reach in 5–10 years.

A CHOICE OF SHRUBS AND ORNAMENTAL TREES

For damp or shaded situations
Abutilon
Aucuba japonica
Azalea
Bamboo
Buddlea
Camellia
Fuchsia
Hydrangea
Jasminium primulinum
Phormium tenax (NZ Flax)
Polygala grandiflora
Rhododendron
Ruscus
Sarrocuccus
Tamarix
Viburnum
Weigelia

For dry situations
Acacia (Dwarf)
Adenandra uniflora
Beaufortia sparsa
Brooms
Buddlea
Callistemon
Cassia
Cotoneaster
Dodonaea purpurea

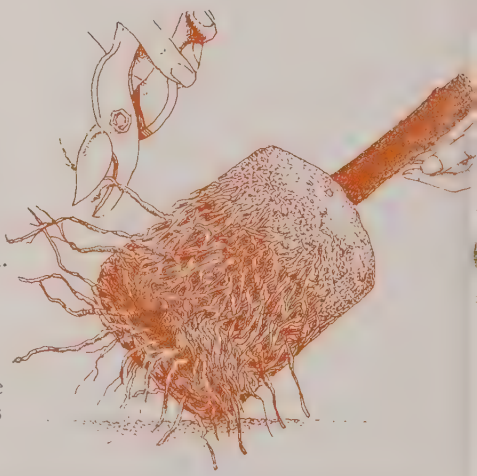
PLANTING STEPS FOR



1. Plant at the right time
Container-grown plants can be planted year round, providing the soil is workable. If it is too wet to dig easily, wait until it dries out. Avoid planting immediately before extreme heat or extreme cold, which are likely to put the plant under stress.

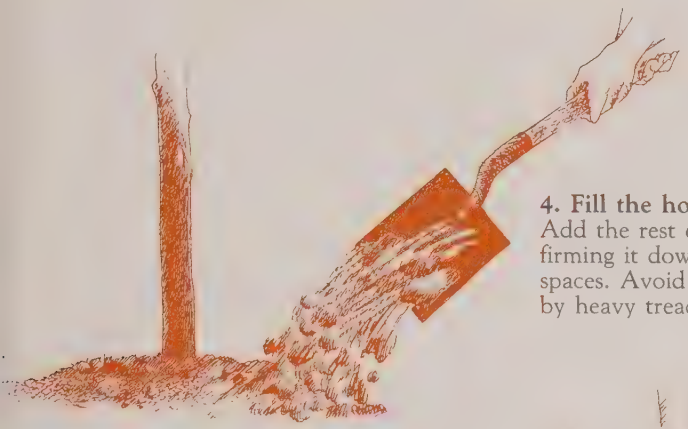


2. Dig the hole
Dig the planting hole approximately twice as wide and to the same depth as the root ball of the tree or shrub. Loosen the soil in the bottom of the hole, breaking it up to allow the roots to travel through easily. Add compost or peat to the soil removed from the hole and mix it well.



3. Take the shrub out of the container
If the root ball is damp it will slip easily. Cut or pull away any circled, matted or tangled roots so they radiate out from the root ball. Shorten the roots to the width of the planting hole so they will not bend when planted. Check the root ball depth in relation to the planting hole. The plant should be no deeper into the soil than it was in the container.

TREES AND SHRUBS



4. Fill the hole in
Add the rest of the soil, gradually firming it down to exclude air spaces. Avoid too much pressure by heavy treading.



5. Watering
The left-over soil can be used to form a raised ring around the plant, creating a basin so that water will be concentrated in the area where it is needed most. Thoroughly water the soil around the root zone. Make sure the plant is firmly in position.



6. Stake if necessary
Newly planted trees or shrubs will need staking if they are extremely top heavy or if planted in an area of high winds. If a stake is necessary, place it on the side of prevailing winds. Tall trees may require 2 or even 3 stakes on opposing sides. Drive in the stake outside of the root ball to avoid damage. Tie the plant to the stake with plant ties or lengths of pantyhose. Do not use wire, which will cut into the stem. Remove the stake after the plant is securely rooted in its new location. This may take one year.

Grevillea
Hibiscus
Isopogon leaucocephalus
Leptospermum
Melaleuca
Oleander
Pittosporum
Protea
Tamarix
Veronica

Spring-flowering, over 2 metres
Acacia
Apple, crab and flowering varieties
Cherry, flowering varieties
Forsythia forunei
Garrya elliptica
Laburnum vulgare
Lilac
Magnolia
Paulownia
Peach, flowering varieties
Philadelphus
Photinia serrulata
Plum, flowering varieties
Podalyria grandiflora
Protea
Rhododendron
Viburnum
Waratah
Kowhai

Spring-flowering, under 2 metres
Acacia (Dwarf)
Azalea
Boronia
Camellia sasanqua
Cantua buxifolia

SPECIMEN TREES **E** EVERGREEN **D** DECIDUOUS				
Botanical Name	Common Name	Rate of Growth	Height x Width	Shape
Acacia baileyana	Wattle E	Fast	5m x 8m	Rounded
Amena floribunda	Monkey Apple E	Moderate	7m x 5m	Rounded
Alectryon excelsus	Titoki E	Slow	7m x 7m	Rounded
Agathis australis	Kauri E	Slow/Med	10m x 1m	Upright
Agonis flexuosa	Willow Myrtle E	Fast	5m x 4m	Weeping
Albizzia julibrissin	Silk Tree D	Fast	6m x 8m	Canopy
Araucaria heterophylla	Norfolk Island Pine E	Fast	15m x 5m	Upright
Banksia integrifolia	Coast Banksia E	Fast	7m x 3m	Upright
Betula pendula	Silver Birch D	Moderate	10m x 4m	Upright
Casuarina	She-Oak E	Fast	9m x 4m	Upright
Cedrus atlantica 'Glauca'	Blue Atlas Cedar E	Slow	10m x 4m	Pyramidal
Cedrus deodara	Indian or Himalayan Cedar E	Slow	10m x 6m	Pyramidal
Cordyline australis	Cabbage Tree E	Moderate	5m x 2m	Upright
Cryptomeria japonica	Japanese Cedar E	Fast	10m x 4m	Pyramidal
Cupressus macrocarpa 'Horizontalis Aurea'	Variegated Macrocarpa E	Fast	5m x 7m	Spreading
Dacrydium cupressinum	Rimu E	Slow	5m x 2m	Upright
Erythrina phebocarpa	Coral Tree D	Fast	6m x 5m	Canopy
Eucalyptus cinerea	Silver Dollar Gum E	Fast	10m x 6m	Upright
Eucalyptus ficifolia	Red Gum E	Fast	8m x 6m	Rounded
Eucalyptus leucoxylon 'Rosea'	Mallee gum E	Fast	8m x 6m	Rounded
Eucalyptus nicholi	Nichols gum E	Fast	6m x 3m	Upright
Eugenia australia	Lilly Pilly E	Moderate	5m x 3m	Rounded
Fagus sylvatica 'Purpurea'	Copper Beech D	Slow	5m x 4m	Rounded
Fraxinus oxycarpa	Claret Ash D	Fast	5m x 3m	Rounded
Gingko biloba	Maidenhair Tree D	Slow	8m x 4m	Pyramidal
Gleditsia triacanthos 'Sunburst'	Yellow Honey Locust D	Moderate	5m x 4m	Canopy
Gleditsia triacanthos	Ruby Lace Red Honey Locust D	Moderate	5m x 4m	Canopy
Grevillea robusta	Silky Oak E	Fast	10m x 5m	Upright
Hoheria populuea	Lacebark E	Fast	6m x 3m	Rounded
Hymenosporum flavum	Australian frangipani E	Fast	6m x 3m	Upright
Idesia polycarpa	Wonderberry Tree D	Moderate	8m x 8m	Rounded
Jacaranda mimosifolia	Jacaranda D	Moderate	8m x 10m	Rounded
Lagunaria patersonii	Norfolk Island Hibiscus E	Moderate	6m x 3m	Upright

Cistus
Clianthus
Daphne
Diosma
Erica
Eriostemon
Felecia augustifolia
Flowering Currant
Genistas
Grevilleas
Isopogon leucocephalus
Judas Tree
Leptospermum (Ti-tree)
Leucospermum reflexum
Prostanthera
Veronicas
Weigelia

Summer-flowering, over 2 metres
Callistemon
Eucalyptus (Flowering Gum)
Habrothamnus
Liriodendron tulipifera
Polygala
Pomegranate
Rhus

Summer-flowering, under 2 metres
Abutilon
Adenandra uniflora
Callistemon (Bottle brush)
Ceratostigma
Cestrum
Choisya ternata
Hibiscus

SPECIMEN TREES **E** EVERGREEN **D** DECIDUOUS

Botanical Name	Common Name	Rate of Growth	Height x Width	Shape
Liquidamber styraciflua	Liquidamber D	Moderate	8m x 4m	Upright
Lieriodendron tulipifera	Tulip Tree D	Moderate	8m x 8m	Spreading
Magnolia campbelli	Magnolia D	Slow	8m	Rounded
Magnolia grandiflora	Magnolia E	Moderate	10m x 10m	Rounded
Magnolia soulangeana	Magnolia D	Moderate	5m x 4m	Rounded
Melia azederach	Bead Tree D	Moderate	5m x 4m	Canopy
Metrosiderous excelsa	Pohutukawa E	Slow	6m x 4m	Rounded
Nothofagus fusca	NZ Red Beech E	Slow	5m x 3m	Upright
Paulownia tomentosa	Umbrella Tree D	Fast	6m x 5m	Spreading
Pinus patula	Mexican Pine E	Fast	6m x 4m	Pyramidal
Pistacia chinensis	Chinese Pistache D	Moderate	6m x 5m	Rounded
Platanus orientales	Plane Tree D	Moderate	6m x 5m	Rounded
Podocarpus dacrydioides	NZ Kahikatea E	Slow	7m x 4m	Upright
Podocarpus ferrugineus	NZ Miro E	Slow	5m x 3m	Upright
Podocarpus totara	Totara E	Slow	6m x 4m	Pyramidal
Prunus campanulata	Taiwan Cherry D	Fast	5m x 3m	Rounded
Prunus 'Shimidsu Sakura'	Flowering Cherry D	Fast	4m x 5m	Rounded
Prunus 'Kanzan'	Flowering Cherry D	Fast	6m x 4m	Rounded
Prunus 'Pink Perfection'	Flowering Cherry D	Fast	6m x 4m	Rounded
Prunus vedoensis 'Purpendens'	Weeping Cherry D	Fast	2.5m x 2.5m	Weeping
Prunus persica 'Cascade'	Weeping Peach D	Fast	2.5m x 1.5m	Weeping
Prunus cerasifera 'Nigra'	Flowering Plum D	Fast	4m x 2.5m	Upright
Quercus palustris	Pin Oak D	Moderate	8m x 6m	Rounded
Rhus seccedania	Wax Tree D	Fast	5m x 4m	Rounded
Robinia pseudocaua 'Fresia'	False Acacia D	Fast	5m x 4m	Rounded
Salix matsudana 'Tortuosa'	Corkscrew Willow D	Fast	6m x 4m	Rounded
Schinus molle	Pepper Tree E	Moderate	6m x 5m	Rounded
Schinus terebinthifolius	Pepper Tree E	Moderate	6m x 5m	Rounded
Sequoia sempervirens	California Redwood E	Moderate	8m x 4m	Pyramidal
Sophora tetraptera	NZ Kowhai E	Slow	4m x 3m	Rounded
Sorbus aucuparia	Rowan Tree D	Moderate	6m x 4m	Rounded
Taxodium distichem	Swamp Cypress D	Slow	7m x 4m	Pyramidal
Tristania conferta	Queensland Box E	Moderate	7m x 5m	Rounded
Ulmus procera 'Louis Van Houtte'	Golden Elm D	Moderate	6m x 5m	Rounded
Viburnum opulus 'Sterile'	Snowball Tree D	Moderate	3m x 2m	Rounded
Virgilia capensis	Virgilia E	Fast	5m x 4m	Rounded
Vitex lucens	NZ Puriri E	Moderate	6m x 5m	Rounded

Hydrangea
Jasminum primulinum
Lantana
Leptospermum (Ti-tree)

Autumn-flowering, over 2 metres
Hoheria (Lace-bark)
Jacaranda
Oleander

Autumn-flowering, under 2 metres
Beaufortia sparsa
Cestrum
Heliostope (Cherry Pie)
Hibiscus
Lantanas
Lasiandra
Melaleuca
Protea
Veronica

Winter-flowering, over 2 metres
Acacia
Buddlea salvifolia
Camellia
Cassia florabunda
Hakea laurina
Luculia gratissima
Poinsettia

Winter-flowering under 2 metres
Abutilon
Boronia
Bouvardia
Chimonanthus praecox (Winter sweet)
Daphne rubra
Erica
Eriostemon
Protea
Strelitzia

Perfumed shrubs
Boronia
Bouvardia humboldtii
Buddlea

SMALL SHRUBS PROSTRATE AND UP TO 1 M **E** EVERGREEN **D** DECIDUOUS

Botanical Name	Common Name	Rate of Growth	Height x Width	Shape
Acer palmatum 'Dissectum'	Weeping Maple D	Moderate	1m x 1.5m	Weeping
Adenandra uniflora	China Flower E	Moderate	60cm x 1m	Rounded
Agapanthus orientalis	Agapanthus E	Moderate	45cm x 30cm	Upright
Azalea cumpo	Azaleas E	Moderate	30cm x 30cm	Rounded
Azalea 'Red Ruffles'	Azaleas E	Moderate	75cm x 75cm	Rounded
Bauera sassiliflora	Bauera E	Moderate	60cm x 45cm	Rounded
Beloperone guttata	Lobster Plant E	Moderate	1m x .60m	Rounded
Calluna vulgaris 'Aurea'	Heather E	Fast	30cm x 30cm	Rounded
Carex morrowii 'Variegata'	Carex E	Moderate	30cm x 30cm	Rounded
Ceanothus	Californian Lilac E	Moderate	.45m x 1.5m	Spreading
Chamaecuparis minima 'Aurea'	E	Moderate	50cm x 35cm	Pyramidal
Chamaecyparis obtusa 'Nana'	E	Moderate	60cm x 50cm	Rounded
Cistus cusitanicus	Rock Rose E	Moderate	60cm x 60cm	Rounded
Coprosma acerosa	E	Fast	.45m x 1.5m	
Coprosma kirkii	E	Fast	.30m x 1.5m	Spreading
Coprosma prostrata	E	Fast	.15m x 1.5m	Spreading
Cotoneaster horizontalis	Rock Spray D	Moderate	60cm x 3m	Spreading
Crowea exalata	Crowea E	Moderate	60cm x 60cm	Rounded
Cuphea ignea	Cigarette Plant E	Fast	40cm x 40cm	Rounded
Cyperus alternifolius	Umbrella Grass E	Fast	75cm x 40cm	Upright
Cytisus beanei	Broom E	Fast	40cm x 75cm	Spreading
Daphne oneorum	Rock Daphne E	Moderate	30cm x 1m	Rounded
Erica cinerea 'Golden Drop'	Heath E	Moderate	15cm x 1	Rounded
Euonymus fortunes 'Gracilis'	Euonymus E	Moderate	30cm x 1m	Spreading
Felicia augustifolia	Daisy E	Fast	60cm x 1m	Rounded
Grevillea fasuculata	Spiderflower E	Fast	20cm x 1m	Spreading
Grevillea obtusifolia	Spiderflower E	Fast	15cm x 1m	Spreading
Hebe 'Inspiration'	NZ Koromiko E	Fast	75cm x 75cm	Rounded
Hosta fortunei	Plaintain Lily E	Fast	45cm x 7cm	Rounded

Choisya ternata
Daphne
Diosma (Breath of Heaven)
Eriostemon 'Profusion'
Flowering Currant
Gardenia
Genista fragrans
Heliotrope (Cherry Pie)
Jasmine grandiflorum
Lantana
Lilac (Syringa)
Luculia gratissima
Magnolia fuscata
Prostanthera

Foliage trees and shrubs
Acer (Maple)
Ampelopsis veitchii (Climber)
Fagus (Copper Beech)
Cherry, Flowering
Crab Apple (Floribunda and Purpurea)
Liquidamber stryraciflua
Nandina domestica
Quercus coccinea (Scarlet Oak)
Persimmon
Photinea
Prunus (plums with brown and bronze foliage)
Rhus cotinus 'Purpureus'

Berrying shrubs
(Berry best in colder districts)
Acmena (Australian Myrtle)
Arbutus unedo (Irish Strawberry Tree)
Aucuba
Berberis
Celastrum scandens (Climber)
Cotoneaster
Eugenia myrtifolia (Australian Rose Apple)
Euonymous
Pyracantha augustifolia
Pyrus aucuparia (Rowan Tree)
Pyrus malus (Crab Apple)
Solanum capsicastrum
Symphorocarpus (Snow Berry)
Viburnum japonica

SMALL SHRUBS PROSTRATE AND UP TO 1 M **E** EVERGREEN **D** DECIDUOUS

Botanical Name	Common Name	Rate of Growth	Height x Width	Shape
Hypericum moserianum 'Tricolour'	St John's Wort E	Fast	4cm x 1m	Spreading
Juniperus chinensis 'Gold Coast'	Juniper E	Moderate	75cm x 1.25m	Spreading
Juniperus communis 'Repanda'	Juniper E	Fast	15cm x 1.5m	Spreading
Juniperus conferta	Juniper E	Fast	20cm x 2m	Spreading
Lantana montevidensis	Trailing Lantana E	Fast	35cm x 2m	Spreading
Lavendula spica	English Lavender E	Moderate	75cm x 75cm	Rounded
Leptospermum scoparium 'Kea'	Manuka E	Moderate	30cm x 45cm	Rounded
Leptospermum scoparium 'Kiwi'	Manuka E	Moderate	30cm x 45cm	Rounded
Libertia peregrinins	NZ Iris E	Moderate	15cm x 1m	Spreading
Nandina domestica 'Pygmaea'	E	Moderate	60cm x 60cm	Rounded
Parahebe lyalii	Parahebe E	Moderate	20cm x 60cm	Rounded
Phormium tenax 'Rubrum'	Dwarf Red Flax E	Moderate	60cm x 6cm	Upright
Picea glauca Albertiana 'Comica'	Dwarf Alberta Spruce E	Slow	1m x 60m	Pyramidal
Pinus mugo	Pine E	Slow	60m x 60m	Rounded
Pittosporum tenuifolium 'Tom Thumb'	Pittosporum E	Moderate	75m x 75m	Rounded
Punica granatum 'Nana Pleno'	Dwarf Pomegranate E	Moderate	60cm x 40cm	Pyramidal
Puya alpestris	Pineapple Shrub E	Moderate	60cm x 1m	Rounded
Rhododendron 'Elizabeth'	Rhododendron E	Slow	60cm x 60cm	Rounded
Rosmarinus lavandulaceus	Creeping Rosemary E	Moderate	30cm x 2m	Creeping
Russelia juncea	Coral Bush E	Moderate	60cm x 1m	Rounded
Santolina	Lavender Cotton E	Moderate	50cm x 1m	Rounded
Thuya occidentalis 'Rheingold'	Rheingold E	Moderate	75cm x 1m	Rounded

Shrubs for coastal planting
*Will stand salt wind.
Others require protection from salt wind.
Banksia
Bougainvillea (Climber)
*Broom (Genistra)
Buddlea floribunda
Callistemon
Cantua buxifolia
*Cistus (Rock Rose)
Clianthus
**Coprosma baueriana* (Taupata)
*Crotalaria
Dodonaea purpurea
Eucalyptus
Feijoa
Griselinea
*Hakea
*Lagunaria
*Lantana
Lasiandra
*Leptospermum (Ti-tree)
Malaleuca laterita
*Norfolk Island Pine
Oleander (Nerium)
*Olearia
Pampas
Phoenix Palms
*Pittosporum varieties
*Pohutukawa
**Podalyria grandiflora*
Polygala grandiflora
Protea varieties
*Tamarix
*Veronica
Waratah (Telopa)
Holly (Ilex)

SHRUBS 1M–2M **E** EVERGREEN **D** DECIDUOUS

Botanical Name	Common Name	Rate of Growth	Height x Width	Shape
Acer palmatum 'Chishio'	Dwarf Japanese Maple D	Moderate	1.3m x 1m	Upright
Agave americana	Agave E	Slow	1.5m x 2m	Erect
Aucuba japonica 'Crotonoides'	Japanese Laurel E	Moderate	1.5m x 1m	Rounded
Berberis darwinii	Barberry E	Slow	1.5m x 1m	Rounded
Boronia heterophylla	Red Boronia E	Fast	1.3m x .75m	Upright
Ceanothus papillosus 'Raweanus'	California Lilac E	Fast	2m x 1.5m	Rounded
Chaenomeles falconet 'Charlot'	Flowering Quince D	Moderate	1.5m x 1m	Rounded
Chamaecyparis pisifera 'Boulvard'	E	Moderate	1.5m x 1m	Pyramidal
Chamaecyparis pisifera 'Filifera Aurea'	E	Moderate	1.25m x 1.25m	Rounded
Choisya ternata	Mexican Orange Blossom E	Moderate	1.5m x 1.5m	Rounded
Coleonema pulchrum	Pink Diosma E	Moderate	1.5m x 1.5m	Rounded
Clianthus puniceus	Red Kaka Beak E	Moderate	1.5m x 1.5m	Rounded
Coprosma repens (Varieties)	E	Moderate	1.3m x 1m	
Cyperus papyrus	Egyptian Papyrus E	Moderate	2m x 1m	Upright
Daphne odora 'Leucanthe'	Daphne E	Moderate	1m x 1m	Rounded
Diosma fricoides	Breath of Heaven E	Moderate	1m x 1m	Rounded
Erica sp.	Heath E	Moderate	1.5m x 1m	Upright
Eriostemon myoporoides 'Protusion'	Wax Flower E	Moderate	1m x 1m	Pyramidal
Euonymous japonica 'Ovatus Aureus'	E	Moderate	1m x 1m	Pyramidal
Fuchsias	Fuchsias E	Fast		Rounded
Gardenia jasminoides	Cape Jasmine E	Moderate	1m x 1m	Rounded
Grevillea (Varieties)	Spiderflower E	Moderate	1m x 1m	Rounded
Grevillea rosmarinifolia	Spiderflower E	Moderate	2m x 2m	

CONIFERS

CONIFER IS is a general term from the Latin meaning 'cone-bearing'. Conifers are a hardy group of plants with a wide range of shape, form and colour. The leaves of the conifer are generally evergreen, varying from the long bundled leaves of the pines to the shorter, sharply pointed leaves of the junipers.

Conifers are useful in landscaping the modern home garden. They are easily maintained and look neat and well groomed with minimum care. Conifers prefer an open sunny site, particularly the golden foliaged varieties which need full sun to obtain their best colour. Good drainage is essential. They will not tolerate wet soil conditions. Soil may be improved by the addition of compost and other organic matter. Conifers require a minimum of pruning. Most of them grow symmetrically, though shaping is always required to maintain the necessary form. This is best done in early spring. The varied colours of conifers enable them to be used in the shrubbery to highlight gardens in both summer and winter. Tall forms are used to provide background and structure to the border. Many can be planted in groups or as lawn specimens or used as tub plants. Many prostrate forms are used in rock gardens and as ground cover subjects on banks or on borders, and clipped as hedges, screens and wind breaks. Some are trained as bonsai. Some are susceptible to diseases which will require spraying when they appear, as they usually cause partial defoliation. Thrips are controlled with Orthene, red spider mites by Coopers Mite Killer, and leaf roller caterpillar by Orthene.

SHRUBS 1M–2M **E** EVERGREEN **D** DECIDUOUS				
Botanical Name	Common Name	Rate of Growth	Height x Width	Shape
Hebe cupressioides	NZ Koromiko E	Moderate	1m x 1m	Rounded
Juniperus chinensis 'Pyramidialis'	EG	Moderate	1.5m x 1.25m	Pyramidal
Juniperus squamata 'Meyeri'	Juniper E	Moderate	1.5m x 1m	Upright
Leptospermum scoparium (Varieties)	Tea Tree E	Fast	1.5m x 1m	Upright
Leucospermum catherinae	Leucospermum E	Moderate	1.5m x 1.5m	Rounded
Leucospermum tottum	Leucospermum E	Moderate	1m x 1m	Rounded
Mahonia bealei	Mahonia E	Moderate	2m x 1.5m	Upright
Mahonia comariifolia	Chinese Holly Grape E	Moderate	2m x 1.5m	Upright
Nandina domestica 'Richmond'	Chinese Sacred Bamboo E	Moderate	1.5m x 1m	Upright
Pieris japonica	Lily of the Valley Shrub E	Moderate	1.5m x 1m	Rounded
Pimelia ferruginea	Rice Flower E	Moderate	1m x 1m	Rounded
Pittosporum tenuifolium 'Purpureum'	Pittosporum E	Fast	1.5m x 1m	Pyramidal
Prostanthera cuneata	Australian Mint Bush E	Fast	1m x 1m	Rounded
Protea cynaroides	King Protea E	Moderate	1m x 1.5m	
Rhododendron chrysomanicam	Rhododendron E	Moderate	1m x 1m	Rounded
Rhododendron 'Winsome'	Rhododendron E	Moderate	1m x 1m	Rounded
Rosmarinus officinalis	Rosemary E	Fast	1.3m x 1m	Upright
Senecio greyii	Senecio E	Moderate	1.5m x 1.5m	Rounded
Teucrium fruticans	Teucrium E	Moderate	2m x 2m	Rounded
Thryptomene calycina	Heath Myrtle E	Fast	1.5m x 1m	Pyramidal
Thuya occidentalis 'Rheingold'	Thuya E	Moderate	1m x 1m	Rounded
Thuya orientalis 'Aurea Nana'	Thuya E	Moderate	1.5m x 1m	Rounded
Viburnum burkwoodii	Viburnum E	Moderate	1.5m x 1m	Rounded
Westringia fruticosa	Australian Rosemary E	Moderate	1.5m x 1m	Rounded
Yucca filamentosa	Yucca E	Moderate	1.5m x 1m	Upright

SHRUBS 2M–4M				
Botanical Name	Common Name	Rate of Growth	Height x Width	Shape
Acer palmatum 'Senkaki'	Red Stemmed Japanese Maple D	Moderate	3m x 2.5m	Rounded
Bambusa gracilis	Fairy Bamboo E	Fast	3m x 2m	Upright
Bambusa 'Wong Tsai'	Bamboo E	Fast	2m x 2m	Upright
Banksia (Varieties)	Banksia E	Moderate	2.5m x 2m	Rounded
Callistemon citrinus	Crimson Bottlebrush E	Fast	2m x 2m	Rounded
Callistemon 'Red Cluster'	Bottlebrush E	Fast	2.5m x 2m	Rounded
Camellia reticulata	E	Moderate	3m x 2m	Rounded
Camellia japonica (Varieties)	E	Fast	2.5m x 2m	Rounded
Cassia corymbosa 'Glauca'	Buttercup Tree E	Fast	2m x 2m	Rounded
Chamaecyparis (Varieties) 'Fernspray Gold'	E	Moderate	2m x 1m	Upright
Corokia virgata 'Bronze King'	Corokia E	Moderate	2m x 1m	Upright
Cortaderia selloana 'Aureo-Lineata'	Gold Band Pampa E	Moderate	3m x 2m	Upright
Cotoneaster harrovianus	E	Moderate	2.5m x 2m	Rounded
Cyperus papyrus	Egyptian Papyrus E	Moderate	2m x 1m	Upright
Cytisus alkus	White Spanish Bloom E	Fast	2m x 1m	Upright
Dzygotheca elegantissima	False Aralia E	Moderate	2.5m x 1.5m	Upright
Dodonaea viscosa	Purple Ake Ake E	Fast	3m x 1m	Upright
Euoynmous japonica 'Albo-Marginatio'	Euonymous E	Fast	3m x 1m	Upright
Euphorbia pulcherrima	Poinsettia E	Fast	2m x 1.5m	Rounded
Fatsia japonica	Japanese Aralia E	Moderate	2m x 1.5m	Upright
Garrya elliptica	Catkin Bush E	Moderate	2.5m x 2m	Rounded
Grevillea	Grevillea E	Fast	2m x 2m	Rounded
Griselinia littoralis	Griselinia E	Moderate	3m x 2m	Upright
Hibiscus (Varieties)	Hibiscus D	Moderate	2.5m x 2m	Upright
Hoheria populena 'Variegata'	Variegated Lacebark E	Fast	3m x 2m	Upright
Ilex aquifolium 'Silver Queen'	Holly E	Moderate	3m x 2m	Pyramidal
Kalmia latefolia	Calico Bush E	Moderate	2m x 1.5m	Rounded
Lagunaria indica	Norfolk Island Hibiscus E	Moderate	2m x 1m	Pyramidal
Leucospermum (Varieties)	Leucospermum E	Slow	3m x 2m	Upright
Ligustrum ovalifolium	Golden Privet E	Moderate	2m x 1.5m	Pyramidal
Luculia gratissima	Luculia E	Moderate	2m x 1.5m	Rounded
Mahonia lomarufolia 'Variegata'	Mahonia E	Moderate	2m x 1.5m	Rounded
Metrosideros kermadensis	Pohutukawa E	Slow	3m x 2.5m	Rounded
Neopanax laetum	Five Finger E	Moderate	3m x 1.5m	Upright
Nerium punctatum	Oleander E	Fast	2m x 1.5m	Rounded
Persoonia penefolia	E	Slow	2.5m x 1.5m	Rounded
Photinia 'Red Robin'	Photinia E	Fast	2.5m x 1.5m	Rounded
Pittosporum (Varieties)	Pittosporum E	Fast	3m x 1.5m	Upright
Podoluria calyptrata 'Graniflora'	Sweet Pea Bush E	Moderate	2.5m x 2m	Rounded
Polygala myriafolia	Polygala E	Moderate	2m x 1.5m	Rounded
Protea nerifolia	Protea E	Moderate	2.5m x 2m	Rounded
Pseudopanax lessonii	Lancewood E	Moderate	3m x 1m	Upright
Pyracantha shawnee	Pyracantha E	Moderate	2.5m x 2m	Rounded
Rhododendron (Varieties)	Rhododendron E	Slow	3m x 3m	Rounded
Taxus braccata 'Fastigiata'	Irish Yew E	Slow	3m x 2m	Upright
Telopea speciosissima	NSW Waratah E	Slow	2.5m x 2m	Upright
Thuja orientalis 'Beverleyensis'	Thuja E	Slow	3m x 1m	Upright
Tibouchina	Casiandra E	Moderate	2m x 1.5m	Rounded
Viburnum opulus 'Sterile'	Snowball Tree D	Moderate	3m x 2m	Rounded
Weigela florida	Apple blossom D	Fast	2m x 1.5m	Rounded

NAMING PLANTS

Common names of plants vary between different countries and in different retions of the same country.

To avoid this confusion a system of naming plants called *The International Code of Nomenclature* is used which classifies plants according to their flower structures.

Each plant is given a binomial Latin mame which is a universal language e.g. The botanical name for corkscrew, tortured or twisted willow is:

Salix matsudana 'Tortuosa'
(Genus) (species) (cultivar)

The Weeping Willow is: *Salix babylonica*

The first word, the *genus*, can be likened to a surname and is always written with a capital letter.

The *species* can be likened to a christian name and recognises the plant precisely.

The *cultivar* (or variety) is sufficiently different from the species to warrant another name. It is written with a capital letter, and placed in quotation marks. e.g. *Coprosma repens* common name taupata or mirror plant has green shiny, round leaves.

There are a number of cultivars including:

Coprosma repens 'Marble Queen' (green leaves speckled with white)
Coprosma repens 'Picturata' (green leaves blotched with a yellow centre)
Coprosma repens 'Silver Queen' (Silver white margined leaves)

SHRUBS AND TREES SUITABLE FOR PICKING

A WIDE variety of showy trees and shrubs make good garden subjects and produce flowers, foliage and/or fruit which are suitable for floral arrangements.

Pick flowers and foliage in the cool, early morning and stand stems in deep water as soon as possible, since when cut material has been out of water for 2–3 minutes an air lock forms at the base of the stem. If material cannot be stood in water immediately, re-cut the stems when arranging in the vase.

Use sharp secateurs to avoid bruising and remove leaves that will be submerged.

Cutting flowers and foliage for the vase is a form of pruning; take care to preserve the shape of trees and shrubs.

Some woody plants and those with sticky or milky latex will respond to preconditioning. Place the stem ends (2–3cm only) in water near boiling point for half a minute to drive out air; this

SUITABLE FOR BERRIES

Shrub or tree	Fruiting Season	Characteristics
Callicarpa dichotoma (Chinese beauty berry)	W	Sprays of lilac-purple berries
Cotoneaster harrovianus	A/W	Orange/scarlet berries, borne in clusters
Cotoneaster horizontalis	A/W	Scarlet berries borne on low growing forms
Cestrum nocturnum (Queen of the night)	Spr	Fragrant flowers at night, white berries
Mahonia lomariifolia	S	Powdery blue berries in clusters
Malus 'Eleyi' (crab apple)	W	Small purple-red flowers and fruit
Malus 'Gorgeous' (crab apple)	W	Miniature apples on bare branches
Malus 'Jack Humm' (crab apple)	W	Clusters of large fruits; red/yellow
Nandina 'Richmond'	W	Consistent crops of red berries
Ochna multiflora	S/A	Shining black seeds on red calyx
Pyracantha (fire thorn)	W	Bunches of red or orange berries
Viburnum trilobum	S/AW	Clusters of bright red berries

SUITABLE FOR FLOWERS		
Tree or shrub	Season	Characteristics
Azalea 'Fielders White'	Spr	Pure white flowers, green throat
Azalea 'Salmonea'	Spr	Semidouble salmon-pink, free flowering
Banksia spinulosa	W	Cylindrical honey-coloured flowers
Berzelia lanuginosa (button bush)	Spr	Broad panicles of white button flowers
Boronia denticulata	Spr	Starry, lilac-mauve flowers
Boronia heterophylla	Spr	Rosy-red flowers in profusion
Bouvardia humboldii	A	Perfumed, white tubular flowers
Camellia	A/Spr/W	Wide variety; float flowers in a bowl
Chaenomeles	Spr	Flowers on bare stems.
Choisya ternata (Mexican orange)	Spr	Clusters of white fragrant flowers
Coleonema pulchrum (breath of heaven)	Spr	Profusion of small pink flowers
Daphne odora 'Rubra'	W	Scented, pink when flowers are open
Deutzia (wedding bells)	Spr	Profusion of small blooms
Erica (heather)	W	Wide variety of forms
Eriostemon 'Profusion'	W	Masses of starry, white flowers
Grevillea 'Robyn Gordon'	A	Large red spider-like flowers
Hibiscus	S	Each flower lasts a day
Hydrangea	S	Mature flowers dry well
Lavandula (lavender)	S	Spikes of tiny, blue, fragrant flowers
Leucadendron lanigerum	Spr	Red/yellow flower bracts; male and female flowers
Leucadendron salignum	Spr	Brightly-coloured bracts red and yellow forms
Leucospermum (pincushion bush)	Spr	Large heads of incurving stamens
Leucothoe fontanesiana	Spr	Long stems of long-lasting small, white flowers
Magnolia	W/Spr	Deciduous, forms flower on bare wood
Malus floribunda (flowering apple)	Spr	Masses of crimson buds open into white flowers
Malus 'Profusion' (flowering apple)	Spr	Masses of red flowers on bare stems
Oxypetalum caerulea (tweedia)	Spr	Clusters of bright blue, starry flowers
Philadelphus (mock orange)	Spr	White, perfumed flowers
Phylica pubescens (flannel flower)	W	Flowers dry well
Protea neriifolia	W	Large, long-lasting blooms

SUITABLE FOR FLOWERS		
Tree or shrub	Season	Characteristics
Protea scolymocephala	W	Profusion of small, creamy-green blooms
Prunus campanulata (Taiwan cherry)	W	Pink bell-shaped flowers on bare wood
Rhododendron johnstonianum	W	Beige-yellow single flowers
Spiraea 'Anthony Waterer'	Spr	Carmine-red flower heads
Stachyurus praecox	Spr	Pendant racemes of small yellow bells
Syringa (lilac)	Spr	Colourful fragrant blooms
Telopea speciosissima (waratah)	Spr	Brilliant red flowers
Thryptomene calycina	W	Pink buds open to starry white flowers
Thryptomene saxicola 'Rosea'	W	Long stems crowded with dainty pink flowers
Viburnum	Spr	White flowers, some species are fragrant

SUITABLE FOR FOLIAGE	
Shrub or tree	Characteristics
Agonis flexuosa (willow myrtle)	Willow-like foliage, pink in spring
Agonis juniperina (juniper myrtle)	Juniper-like foliage
Aucuba japonica 'Crotonoides'	Grow in shade; has large, gold-splashed leaves
Chamaecyparis 'Crippsii'	Golden-yellow, frond-like foliage
Euonymus 'Aureo-marginatus'	Gold and green variegated foliage
Fagus 'Purpurea' (copper beech)	Mature leaves of rich, deep purple
Leucothoe 'Gerard's Rainbow'	Foliage in tones of yellow, green and pink
Ligustrum 'Aureum' (golden privet)	Brilliant gold and green variegated foliage
Photinia 'Red Robin'	Bright red spring growth

treatment improves water uptake.

Keep vases topped up and change water regularly; a few drops of household bleach in the water will extend the vase life of cut flowers and foliage. Dirty vases are a source of stem infection; clean by filling with water and adding one teaspoon of household bleach to 600ml of water. Allow to stand for a few hours before scrubbing clean.

AZALEAS, CAMELLIAS AND RHODODENDRONS

AZALEAS, CAMELLIAS and rhododendrons provide a bewildering variety of briliant flowers in winter and early spring. In addition the open, picturesque form of rhododendrons and azaleas and the dense, dark green foliage of camellias make them most attractive plants in their own right. When planted in favourable conditions and given the right growing conditions, they are easy, carefree, long lived, and much valued plants.

In New Zealand, where ample and general rainfall is experienced, these plants can be grown to perfection. While they tolerate sun, they will do best in a position where there is shade. A well

drained acid soil that also retains moisture is essential. Peat should be dug into the soil before planting and used as a mulch.

In heavy clay soil, raised beds of peat overcome the problem. Protection from wind, sun and excessive summer heat is also necessary, although some varieties are more tolerant than others.

Regular watering during dry periods is essential. Avoid cultivating around the roots as the shallow roots are easily damaged. A peat mulch will retain moisture, moderate soil temperatures and will help control weeds.

Lightly prune if necessary after flowering. Fertilise in spring with Gro-Plus Azalea Camellia and Rhododendron fertiliser.

HEDGES

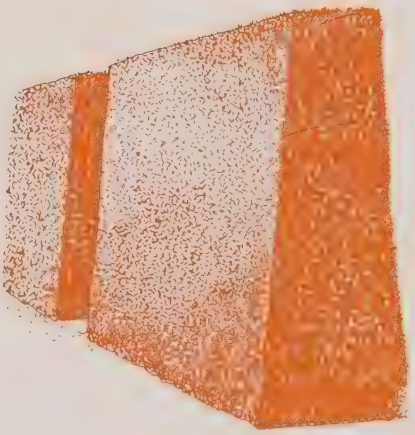
THE PURPOSE of a hedge is to act as a screen and provide some privacy for a

WHAT CAN GO WRONG WITH AZALEA, CAMELLIA AND RHODODENDRON

Problem	Symptoms	Remedy
Aphids	Clusters of insects on young growth.	Spray with Orthene at 2 weekly intervals.
Mites	Leaves yellow (stippled or mottled) and dehydrated in hot dry weather.	Spray with Mite Killer
Thrips	Leaves silver and dry. Brown-black specks appear on underside of leaves.	Spray with Orthene at 2–3 week intervals through summer.
Sooty Mould	Black sooty mould on leaves and twigs.	Sooty mould fungus lives on honeydew excreted from sap-sucking insects. Spray with Orthene or Shield.
Leaf Gall	Developing leaves and flowers are thickened, fleshy and pale green. As the thickenings enlarge, they become white or pink, with a powdery appearance during wet weather.	Remove and burn all infected parts. Spray with Shield.
Petal blight	Earliest symptom is light brown or whitish coloured circular spots on petals. Spots enlarge to form irregular blotches until whole flower collapses. Petals feel slimy when rubbed between fingers. Diseased flowers dry up and cling to the plant (leaves and stems are not affected).	Avoid overhead watering. Pick off diseased flowers. Spray at two weekly intervals with Bravo and Shield.
Lack of Fertiliser	Leaves yellow and/or developing dark purple tone. Slow stunted growth.	Fertilise with Gro-Plus Azalea, Camellia and Rhododendron food in late spring after flowering finishes and just before new growth starts.
Soil too Alkaline	Decline in vigour and leaves turn yellow while the veins remain green.	Fertilise with Gro-Plus Azalea, Camellia and Rhododendron Food in late spring after flowering finishes and just before new growth starts. Do NOT lime.

garden. It can also be used to hide unsightly objects and provide wind protection.

The plants of a hedge are planted close together so they form an unbroken line. There are many shrubs which can be used to make a hedge but some lend themselves more readily to trimming and formal growth. To keep a hedge healthy, sunlight and air must be able to reach the bottom of the hedge as well as the top. When pruning and trimming make sure the base is wider than the top. The following factors should be considered when choosing a suitable hedge for your situation.



LARGE PLANTS COMMONLY USED FOR HEDGES							
Tall Hedges 3 metres +	1	2	3	4	5	6	7
Acmena	EX	EX	VG	FAIR	VG	EX	EX
Bamboo	VG	VG	G	VG	EX	EX	G
Cryptomeria	POOR	VG	G	EX	VG	POOR	EX
Cupressus leylandii	G	VG	VG	EX	VG	POOR	VG
Casuarina	G	G	VG	VG	G	G	VG
Phebalium	POOR	EX	EX	VG	VG	VG	EX
Poplar chinesis	VG	EX	VG	EX	VG	EX	EX
Pittosporum	EX	VG	EX	VG	VG	VG	VG
Salix humboldii	G	VG	G	VG	EX	EX	VG
Thuya plicata	VG	VG	VG	EX	VG	POOR	G
Small Hedges 1–3 metres							
Abelia	VG	VG	VG	EX	G	VG	VG
Escallonia	VG	VG	EX	EX	G	VG	VG
Euonymous (Golden)	VG	VG	EX	VG	VG	VG	G
Flax	VG	VG	EX	EX	VG	VG	G
Lonicera	VG	VG	VG	EX	G	VG	VG
Photinia (Red Robin)	VG	VG	VG	VG	VG	VG	VG
Privet (Golden)	VG	VG	G	EX	G	VG	VG
Tecoma	VG	VG	VG	EX	G	EX	G

1. Tolerance of heavy clay soil or poor drainage
2. Tolerance of light sandy soil
3. Tolerance to coastal conditions
4. Tolerance to frost
5. Amount of trimming required.
   Excellent = annual trimming is usually sufficient
   Very good = trim twice a year
   Good = trim 3–4 times a year
6. Ability to recover from a hard cut back
7. Rate of growth

PLANT TRAINING AND PRUNING

PRUNING INVOLVES the removal of part of a plant for the benefit of all of the plant.

The main objectives are: to remove dead, dying and diseased wood and to prevent infection spreading to healthy wood; to open up the tree to light and air which helps prevent the build-up of pests and diseases; to train a tree to the shape required by the gardener and the site of the tree; and to provide an even distribution of healthy fruiting or flowering wood which will produce large, well-shaped, healthy fruit or flowers.

Before leaves and stems appear they exist as small swellings on stems and branches called buds. In spring, buds swell and lengthen into stems and producing leaves or bursting into flower. The flowers then produce fruit.

There are three main kinds of buds: terminal, lateral and flower.

- A terminal bud grows at the tip of a shoot.
- A lateral bud appears on the side of a stem.
- A flower or fruit bud is shorter, blunter and fatter than vegetative (leaf producing) buds. Flower buds appear on spurs on fruit trees and can be either in a terminal or lateral position.

On some stems that are two or three years old, rings are noticeable: these are annual bud scarrings and show the length of each year's growth. When pruning always cut just above a bud. A terminal bud grows most strongly. When it is removed, the lateral bud which is now at the tip of the stem inherits its strength. When to prune is probably the most bewildering question for the beginner. Before starting, one needs to know:

- when the plant flowers
- on what kind of wood it flowers or shoots from – the current season, one-year-old wood or two-year-old wood, or older. Plants that flower on shoots from the current season should be pruned before the plant flowers. Plants that fruit or flower on one-year-old wood, e.g. forsythia, peaches, should be pruned after flowering.

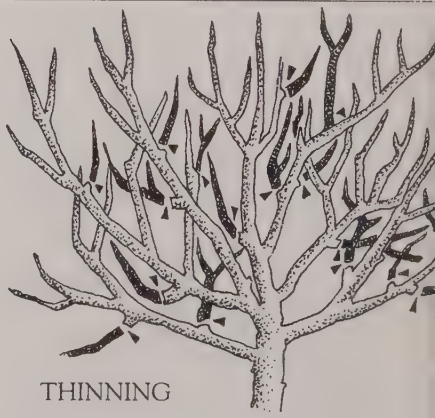
A wounded tree has a natural defence mechanism. A new skin in the form of a callous grows from the edge of the wound to eventually cover the surface. This may take several years, but there are

PRUNING METHODS

PINCHING

The first opportunity to control or direct plant growth is to remove or to pinch out the terminal bud. This is especially useful with young plants when you want to make them bushier, e.g. Petunia. Conversely, if you want the plant to gain height, keep side growth pinched back so the terminal bud on the main stem continues to elongate, e.g. tomatoes.





THINNING

Thinning removes stems or branches, opening the plant up. It enables old and unproductive wood to be removed, removes branches that are growing in awkward directions and it produces a taller and more open plant.

a number of factors which can affect the speed with which it takes place. The most important is the form of the pruning cut. There are two extremes to avoid, the stub and the flush cut. The long stub left after pruning may provide a source for decay and fungi and it is also likely to interfere with the closing of the wound. A flush cut results in exposing more wood than is necessary and leaves a larger wound. The happy medium between a stub and a flush is the common sense approach to avoid unwarranted injury.

To encourage the tree to produce a callous as rapidly as possible, drying out of a wound should be prevented. Cover all fresh pruning cuts with pruning paint.

Research has shown that a dressing containing a fungicide promotes faster callous formation. Callous growth is greater in larger wounds than smaller, excepting old trees where growth has slowed right down. Many problems can be avoided by keeping pruning wounds small. Trees should be pruned and trained when young and suitable species chosen which will not grow too large for their particular site.

Pruning tools should be clean and sharp (see the chapter on Garden Tools). Cuts must be smooth with no rough torn edges and care must be taken not to squeeze or bruise the branches as this increases the risk of infection. Pruning should never be done in the rain, as fungus and bacteria spores are transported in moist air. All pruning wood should be gathered and burnt to prevent the build up of disease. With care and common sense, the risk of infection from exposed cuts can be minimised and the natural defence mechanism of the tree encouraged.

General Rules of Pruning

- Use good quality tools and make sure they are sharp and clean.
- Cut out diseased, dead and weak growth. Always prune back to healthy wood which is free of staining.
- Collect all prunings. Compost them if they are soft and healthy. Burn them if they are woody or diseased.
- All cuts must be clean. Smoothe all edges and protect with pruning paint.



PRUNING CUTS

There is a correct way to make pruning cuts which helps direct new growth and facilitates the healing of the wound. A pruning cut should be made close to an outward facing bud. The lowest point of the cut should be even with the top of the bud and slanting upwards at 45°. Large, heavy branches should be removed in stages to avoid unnecessary damage. Trim back to a stub of 45–60cm which can then be removed safely, leaving a clean surface.

HEADING BACK

Heading back keeps the plant denser and sturdier. To head back, cut around the entire shape of the plant.





CHAPTER FOURTEEN

NEW ZEALAND NATIVE PLANTS

UNTIL THE arrival of Europeans, apart from some burning-off by moa hunters in the south, the native forests and plants of New Zealand maintained balanced growth over most of the country. Then in the days of pioneer farming, a major aim was the destruction of native plants over vast areas to make room for grazing livestock. In addition, the gardens of the early pioneers were stocked with plants from Europe, North America, Japan and the Himalayas.

Even today New Zealand gardeners are often better informed about plants from other lands than they are about New Zealand plants.

THE NEW ZEALAND flora consists of approximately 2,000 flowering plants and 150 ferns. Many of these plants are unique, because New Zealand has been isolated from other land masses for many millions of years. Our native flora offers a varied collection of species of different size, form and texture and colourful flowering plants. Their value as garden plants has been recognised overseas and many are now exported to Europe and America. In addition, the foliage of many native plants is used by exponents of floral art in New Zealand and overseas and there is a growing export industry of foliage for this purpose (Phormium, Coprosma, Leptospermum, Lophomyrtus, Pittosporum and Hebes are just a few of the plants used.)

The great majority of natives are easy to grow and will thrive in any good garden soil. For quick, successful establishment, choose young nursery-grown plants and plant in winter in well prepared soil. The drainage of heavier soils can be improved by adding extra topsoil and peat to provide raised planting sites. Staking is usually necessary for the first two years and early training of trees is essential to prolong life and good health. For the first few summers keep weeds away from the bases of newly planted trees, which will require regular watering. Mulching with organic materials will conserve moisture and help suppress weeds as well as improving soil structure. Most trees will respond well to an annual light dressing (50 g/m^2) of Gro-Plus General Garden Fertiliser in early spring.

In recent years new cultivars have become available. Manuka is just one example where a whole range of white, pink and red flowering varieties are available in single and double forms with prostrate and pendulous habits.

Coprosmas, Pittosporums and the flaxes (Phormium) are particularly valuable as garden plants.

COPROSMAS AS GARDEN PLANTS

THERE ARE approximately fifty species of Coprosma in New Zealand. They are mostly shrubs or small trees and vary in height from a few centimetres to several metres. They are common throughout the country, some in the alpine regions, which are different from those found among seashore vegetation or others which occur as undershrubs in the forests. Some taller tree species have large, attractive, glossy leaves whilst others, especially the divaricating shrubs, have minute leaves. Many produce small brightly coloured fleshy fruits but if grown in the garden for their berries they must be planted in groups, because male and female flowers are formed on different plants.

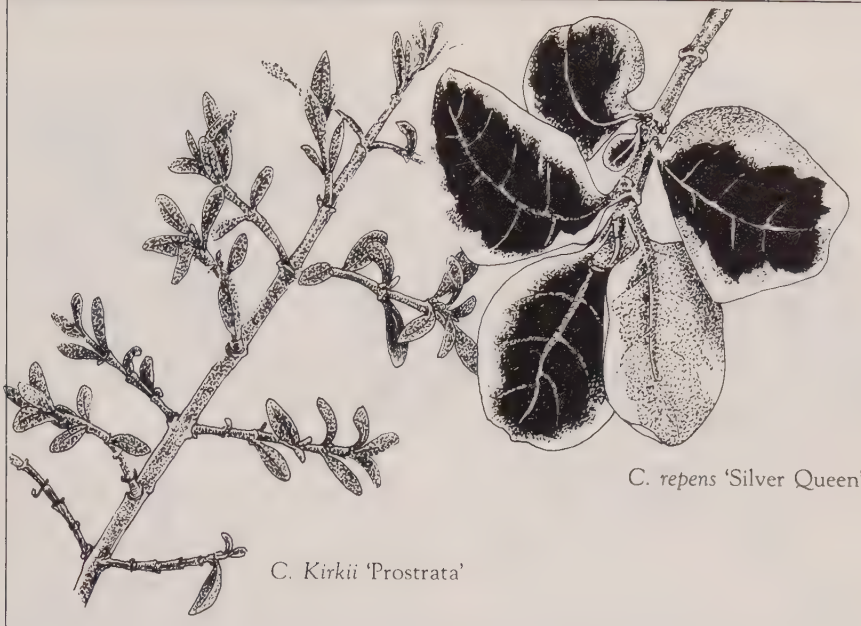
Coprosma repens and its many cultivars are extremely useful in coastal districts as shelter and hedge plants; their shiny leaves make them excellent background shrubs. Cultivars such as 'Picturata', 'Variegata' and the hybrids 'Beatson's Gold' and 'Coppershine' add colour to any shrub planting. The divaricating species make interesting specimen shrubs in a bark or pebble garden. The dense prostrate species such as *C.acerose*, *C.brunnea* and *C.X kirkii* and their cultivars make excellent quick growing ground cover in most situations.

Most cultivars are quick growing; they are best in open situations but will tolerate semishade. To keep them in an attractive form they need constant pruning and grooming in spring and midsummer to promote the new, well coloured foliage. They are practically free of disease and insect pests; occasionally *Coprosma repens* and its cultivars can be frost tender.

PITTOSPORUMS AS GARDEN PLANTS

PITTOSPORUMS AND their variegated cultivars have won a place in horticulture as foliage shrubs. Most species produce in spring small, delightfully fragrant flowers. They are quick growing and will give maturity to a new garden; they can be used as hedges, background shrubs or small species and cultivars will give variety to any planting. Although some species are frost tender a number are resistant to salt spray and make excellent

A SELECTION OF COPROSMAS



C. *repens* 'Silver Queen'

C. *Kirkii* 'Prostrata'

	Name	Foliage colour	Comments
Shrubs over 1 m	C. *crassifolia*	Small, pale green	Much branched, wiry habit
	C. (coastal hybrid)	Shiny green	Compact, spreading shrub
	C. *repens*	Shiny green	Handsome foliage shrub
	C. *repens* 'Picturata'	Yellow margined with green	
Shrubs under 1 m	C. 'Beatson's Gold'	Small, gold centre	Dense habit
	C. 'Coppershine'	Shiny, brown shading	
	C. 'Greensleeves'	Shiny green	
	C. 'Williamsii Variegata'	Margined creamy-white	Requires shade
Groundcovers	C. *Acerose* hybrids	Small, golden brown	Interlacing branches, variable
	C.X *kirkii* 'Kirkii'	Small green	
	C.X *kirkii* 'Prostrata'	Small, shiny green	Requires clipping to keep prostrate
Hedges	C. *repens*	Shiny green	Coastal hardy, quick growing
	C. *repens* 'Picturata'	Yellow, margined with green	

A SELECTION OF NEW ZEALAND PITTOSPORUMS



P. eugenioides'Variegatum'

P. tenuifolium 'Sunburst'

P. crassifolium 'Karo'

TREES	
P.eugenioides Tarata	To 5 or more metres in 10 years. Sweetly scented yellow flowers.
P.eugenioides 'Variegatum'	3 m. Light green leaves, heavily margined with creamy white.
P.tenuifolium Kohuhu	3–5 m. Erect growing, black stems and pale green leaves 3–7 cm long.
P.tenuifolium 'Variegatum'	3–5 m. Dark stems, oval leaves variegated pale green and creamy white.
P.umbellatum	3–5 m. Pink flowered; dark green leaves. Handsome tree.
SHRUBS	
P.tenuifolium 'James Stirling'	Trim in early spring with shears. Dainty form, sparse foliage.
'Marjorie Channon'	Silver leaves with narrow cream margins.
'Rotundifolium'	Black stems, rounded leaves pale silvery green and variegated creamy white.
'Silver Sheen'	Silver-leaved form of kohuhu.
'Stirling Gold'	Small leaves with gold centres; red new stems.
'Sunburst'	Leaves variegated gold and lime green.
HEDGES	
P.crassifolium Karo	Particularly good for exposed positions.
P.eugenioides Tarata	Excellent informal habit.
P.tenuifolium Kohuhu	Regular clipping makes a neat, formal hedge.

hedges in a windswept situation. Young nursery grown plants should be planted out in autumn; this is especially important when establishing plantings in exposed situations. To keep plants compact they will need trimming with shears in the spring before new season's growth is formed.

If grown in sheltered areas some cultivars are susceptible to an Alternaria leaf blight and are best planted in open situations. Aphids can be a pest on cultivars of *P.tenuifolium* whilst blister scale (psillids) will cause distortion of young growth of both *P.crassifolium* and *P.tenuifolium*. A spray of Target or Orthene in October and again in February will control this pest.

FLAX AS GARDEN PLANTS

FLAXES ARE large herbaceous perennials belonging to genus *Phormium*. Named cultivars are available in a wide range of foliage colours and growth forms. They are amongst the most useful of our native plants, being equally at home in the shrub border, in pebble or bark gardens and as tub plants. Flax is a hardy coastal plant which will grow in almost any soil or situation. Modern cultivars of mountain flax require well drained soils. The quantity of flowers produced varies between cultivars. Tuis visit the flowers for nectar.

Flaxes are propagated by division. Lift and divide the rhizome in late autumn; each piece must bear one terminal fan and have the leaves shortened by one half. Many coloured cultivars are not completely stable. Discard fans with inferior colouring and replant the best in well drained soil. Do not bury the rhizome, plant at the same depth as the parent. A stake will be necessary in exposed situations until new roots anchor the plant. Plants should be divided every three to four years and established plants will benefit from a light application (50 g/m^2) of Gro-Plus General Garden Fertiliser in spring. Remove faded, damaged and dead leaves regularly.

Two pests require regular control. Leaf cutting moth is controlled by Carbaryl applied in November and March. Scale insect is controlled by Orthene and oil combined, applied in November and February. Spray must penetrate leaf bases of the crowns.

LEPTOSPERMUM AS GARDEN PLANTS

THE NEW ZEALAND tea tree belongs to the genus *Leptospermum*. The two most common are, the kanuka (*L.ericoides*) where the flowers are borne in clusters and the foliage is soft and feathery, and manuka (*L.scoparium*) where the flowers are borne singly and the leaves are stiff and pointed. They are found throughout the country from sea level to sub-alpine regions and in the wild show great diversity in growth forms and sometimes in flower colour and size. The common name originated because early settlers used the leaves as a substitute for tea.

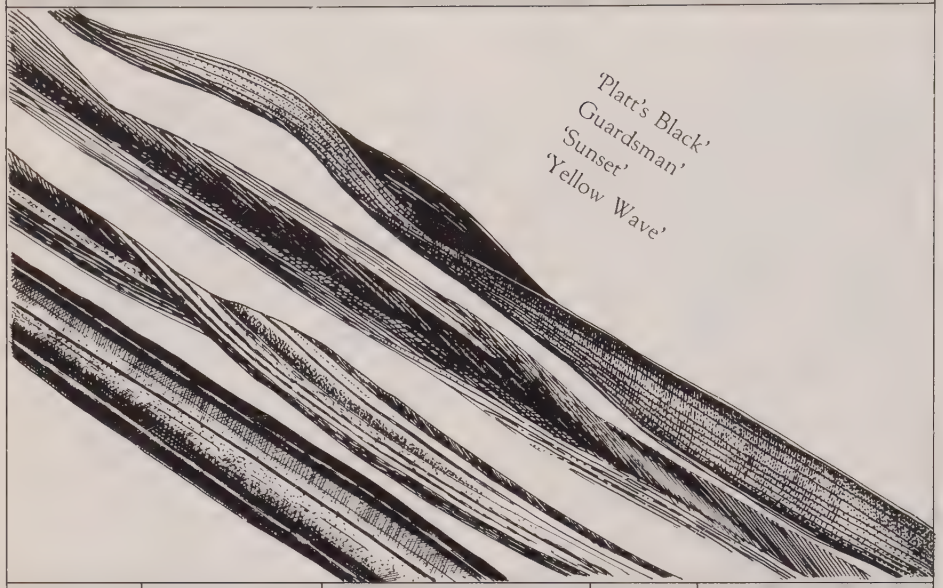
Garden Use

Until recently kanuka was rarely grown in gardens but it will quickly form an attractive small tree in exposed situations on difficult soils. In manuka a number of distinct growth forms and flower colours have been brought into cultivation and hybridised to produce cultivars which are now well established garden plants in New Zealand and overseas. Cultivars vary from erect shrubs to dwarf forms suitable for rock and bark gardens to prostrate forms suitable for ground covers and crib walls. Flower colour varies from scarlet, deep rose and all shades of pink to white. Amongst the shrubs many attractive double-flowered cultivars have been developed. Some cultivars flower for nearly six months of the year.

Cultivation

Propagation of cultivars is from semi-ripe tip cuttings taken in autumn; the species grows readily from seed. They prefer a well drained soil and sunny position. Prune immediately after flowering to maintain a bush habit by shortening the flowering wood to approximately one third its length. To retain the natural character of the plant, use secateurs to shorten growths individually rather than clipping to a 'neat shape' with hedge

A SELECTION OF PHORMIUM CULTIVARS



Size	Cultivar	Foliage Colour	Habit	Comments
Large, over 150 cm	*P.* 'Black Prince'	Bronze	Weeping	Requires sheltered position leaf ends split, florists' foliage.
	P. 'Burgundy'	Bronze	Upright	Bold landscaping, erect habit florists' foliage.
	P. 'Guardsman'	Bronze/red variegated	Upright	Brightly coloured form, regular grooming essential.
	P. 'Platt's Black'	Dark	Weeping	Darkest form available.
	P. 'Williamsii Variegatum'	Green/yellow variegated	Weeping	Good for bold landscaping.
Medium 100–150 cm	*P.* 'Dark Delight'	Dark	Weeping	Excellent dark form.
	P. 'Duet'	Green/yellow variegated	Upright	Attractive plant, good flowerer.
	P. 'Sunset'	Bronze/yellow variegated	Weeping	Best apricot-variegated form for shade, tidy.
	P. 'Yellow Wave'	Green/yellow variegated	Weeping	Bright bold effect, divide and replant every two or three years.
Small 50–100 cm	*P.* 'Green Dwarf'	Green	Upright	Attractive flowers and foliage, good drainage essential.
	P. 'Rubrum'	Bronze	Weeping	Good florists' foliage.

clippers. Plants benefit from a light application (50 g/m²) of Gro-PlusGeneral Garden Fertiliser in spring.

Most forms of *L. scoparium* are susceptible to a conspicuous black mould which covers all parts of the plant. Scale insects on the plant secrete a sweet syrupy liquid which forms a medium for fungus growth. Spray with Orthene and oil combined in November and repeat in February to control the scale and the mould will disappear. The 'Nanum' group appears relatively resistant. Leaf roller caterpillar and bag moth can infest plants; they will be controlled with an Orthene/oil spray.



NATIVE FERNS

FERNS ARE a dominant feature in our native flora. They grow in a variety of habitats from dry hillsides to sheltered humid valleys. Over the years a number of species have proved to be good garden plants.

Tree ferns such as the black mamaku are too large for a modern city garden but smaller species will provide interest in sheltered, cool, shady corners. When incorporated in an evergreen foliage shrub border, they give a New Zealand identity to the planting and provide an interesting form and texture. They also make excellent ground cover under deciduous trees or among young plantings of camellias, magnolias and rhododendrons. In scree gardens, species such as *Blechnum penna-marina* and *Doodia media* add variety to the planting.

Most species grow best when planted in friable well drained soil; they will not tolerate wind and a number are frost sensitive. Care is needed not to plant too deeply; the crown should never be buried. Most require moist, shaded conditions but will not tolerate wet, poorly drained soil.

Propagation depends on the species; a number can be increased by division whilst in others only a single crown is produced; these species must be produced from spores.

A few species such as *Asplenium bulbiferum* – the hen and chickens fern or moku – buds off small bulbils on the leaves; if mature bulbils are taken with a small portion of the leaf and placed in moist potting mix, roots are quickly formed and a new plant is obtained.



LEPTOSPERMUM CULTIVARS



L. *scoparium* 'Martinii'

Size	Cultivar	Flower Colour	Flower Type and Size mm	Flowering Time (Auckland)
Shrub 2 m	*L.* 'Blossom'	White, flushed pale pink	Double 15	April-November
	L. 'Crimson Glory'	Deep red	Double 15	April-November
	L. 'Kare Kare'	Clear white	Single 15	August-November
	L. 'Keatleyi'	White, flushed with pink	Single 25	April-November
	L. 'Martinii'	Bicolour effect; pink/pale pink	Single 20	March-November
	L. 'Red Ensign'	Deep red	Single 15	March-November
	L. 'Rose Queen'	Bicolour effect and light pink	Single 20	March-October
	L. 'Rosy Morn'	Rosy pink	Double 15	March-November
Shrub up to 1 m	*L.* 'Cherry Brandy'	Rosy pink	Single 15	March-October
	L. 'Elizabeth Jane'	Rosy pink	Single 10	May-November
	L. 'Kea'	White, tinged pink	Single 10	May-November
	L. 'Ruru'	Rosy pink, darker centre	Single 10	May-November
Groundcover	*L.* 'Pink Cascade'	White, flushed pink	Single 20	March-October
	L. 'Red Falls'	Red	Single 10	April-September

A SELECTION OF NATIVE TREES



Kauri, Male cone



Kowhai flowers

5–10 metres (the height it will reach in 10–15 years in average conditions)		
Agathis australis	Kauri	Slow growing NZ conifer forming a stately, pyramidal-shaped specimen. Older trees are compactly branched, leaves are olive green.
Alectryon excelsus	Titoki	A spreading tree with handsome foliage, it requires shelter. When ripe, fruit splits revealing black seed in scarlet cup.
Dacrydium cupressinum	Rimu	Outstanding specimen tree with drooping foliage. Requires a rich moist soil sheltered from winds. Hardy.
Metrosideros excelsa	Pohutukawa or NZ Christmas Tree	One of the finest flowering trees. Excellent for coastal planting. Tolerant to most soil types.
Knightia excelsa	Rewarewa	A tall, slender, erect tree with leathery leaves and maroon, bottlebrush flowers.
Libocedrus plumosa	Kawaka	Upright conifer with feathery foliage. A good lawn specimen.
Podocarpus totara 'Aurea'	Golden Totara	Compact conifer, form with golden yellow foliage. Slow growing, requires pruning to maintain compact and upright habit.
2.5–5 metres		
Dodonaea viscosa 'Purpurea'	Purple Akeake	Good foliage plant with purplish-red leaves and purplish-red seed capsules in summer.
Leptospermum ericoides	Kanuka	Provides striking display in full bloom; masses of small white flowers in December. Feathery foliage, graceful habit.
Meryta sinclairii	Puka	Has large bright green leaves and tropical appearance. Best grown in sheltered position in good soil. Excellent tub plant.
Metrosideros kermadecensis 'Variegata'		Good foliage plant, dark green leaves variegated with broad creamy white margin. Deep crimson flowers. Excellent tub plant.
Sophora tetraptera 'Chevalier'	Kowhai	Selected free-flowering form bearing masses of large, yellow flowers.

A SELECTION OF NATIVE SHRUBS		
Over 1 metre		
Clianthus puniceus	Kaka beak	Spreading habit, bunches of large pea-shaped flowers in summer. Frost tender.
Corokia 'Red Wonder'		Spreading habit, red berries in autumn.
Corokia 'Yellow Wonder'		Compact habit, yellow berries in autumn.
Griselinia littoralis	Kapuka t	Dense habit, large, mid-green leaves.
Griselinia lucida	Puka t	Large foliage plant with large shiny leaves.
Lophomyrtus 'Kathryn'		Upright, dense habit, dark crinkled foliage. Susceptible to thrips.
Macropiper excelsum var psittacorum		Compact habit with heart-shaped mid-green leaves.
Melicope ternata	Wharangi	Open habit, glossy green leaves.
Olearia thompsonii		Much branched shrub, dark green leaves, panicles of white flowers.
Pennantia corymbosa	Kaikomako	Forms handsome, slender tree with abundant white flowers.
Pisonia brunonianam 'Variegatum'	t	Large leaves irregularly margined with creamy yellow. Shelter from strong winds and frost.
Pomaderris kumeraho	Kumarahou	Well branched shrub, mass of yellow flowers in spring.
Pomaderris polifolia		Densely branched shrub bearing cream flowers in spring.
Pseudopanax 'Gold Splash'	t	Many branched, bright, gold-splashed leaves.
Under 1 metre		
Brachyglottis greyi	syn Senecio	Soft-grey foliage, good drainage essential.
Hymenanthera crassifolia		Densely branched shrub, dark green leaves and light grey bark.
Metrosideros carminea	Akakura	Forms a dense bush bearing brilliant carmine flowers in spring. Frost tender, susceptible to thrips.
Metrosideros diffusa		Dense habit, mid-green leaves.
Metrosideros perforata		Light green new growth, maturing to dark green; white flowers.
Muehlenbeckia astonii		Much branched interlacing shrub, hardy.
Ground Cover		
Fuchsia procumbens		Slender, spreading plant bearing large red fruit; deciduous.
Myoporum debile		Dense, prostrate habit, purple fruit in winter.
t = Suitable for tub plants		

CHAPTER FIFTEEN

LAWNS AND GROUND COVERS

THE LAWN is the most characteristic feature of the traditional garden; provides a smooth living carpet for relaxation and recreation. Establishing and maintaining a lawn can be very rewarding and bring an immense amount of satisfaction.

This chapter also deals with low-growing plants which can form carpets of foliage under trees and bushes, or provide ground-cover where flowers or differently shaped leaves are preferred to lawn.

THE CHOICE OF LAWN SEED

LAWN SEED mixes are a blend of different grass species. The choice of mix will depend on the climate and intended use of the lawn. When planning a lawn, selecting the correct lawn mix can mean the difference between success and failure.

Lawn grasses are abused more than any other group of plants. They are repeatedly trodden and crushed. As soon as they hold their leaves up, a mower cuts them down, but they must still look green and keep growing. This requires special qualities!

The following species are commonly used in lawn seed mixes.

Brown Top:
Has limp flat leaves which lie flat and remain close to the ground. This provides excellent ground cover.



Chewings Fescue:
Has leaves which are more needle-like and erect. This gives the lawn more leafage and 'life'. Chewings Fescue is tolerant of shady conditions.



Perennial Rye Grass:
Has coarse, tufted leaves and is hard-wearing.



Elka:
A new superfine ryegrass. The leaves are so fine they can be compared in appearance to a fescue rather than the traditional ryegrass. It is fast germinating and produces a quick, dense ground cover. It also has a slow growth habit and requires less mowing.

Elka is suited to all soil types and climatic zones in N.Z. It is extremely hard-wearing and popular in sports-grounds.



Clover:
Clover is sometimes added to lawn mixes. It has the advantage of staying green over the summer in dry areas where fine grasses may brown off.

Can be slippery when wet and when in flower attracts bees.



Coated lawn seed, which has a thin layer of fertiliser and bird repellent covering, is often a popular choice. While it would appear to offer advantages, there can be problems associated with its use. Coated seed is slower to germinate which means it is vulnerable to drying out and the lawn is more susceptible to weed invasion during the early establishment stage. Uncoated seed is quicker germinating and more economical.

One kilogram of uncoated seed contains twice the number of seeds as one kilogram of coated seed because half the weight is in the 'coat'. Different mixes are formulated for particular uses.

LAWN SEED MIXES			
Name	Coated	Mix	Comments
Superfine Showlawn	Yes	Fescue Browntop	The ultimate luxury lawn, withstands close mowing. Highly tolerant of shady or dry conditions. A beautiful lawn but requires constant care.
Mow-it-less	Both	Elka Fescue Browntop	Highly attractive fine leafed lawn that needs little maintenance. Very fast germinating and quick to establish, the mature lawn is slower growing with a dwarf habit – needs far less mowing! Good tolerance to dry conditions and shade. Extremely hard-wearing.
Country Touch	Both	Rye Fescue Browntop	Vigorous, hard-wearing and relatively economical lawn. Suited to a wide range of conditions. Requires regular mowing to retain good appearance.
Colonial	No	Rye Clover	Fast germinating and easily established. Good choice for not-so-perfect soils as clover 'feeds' nitrogen to the soil, and stays green through all but the driest conditions. Requires frequent mowing

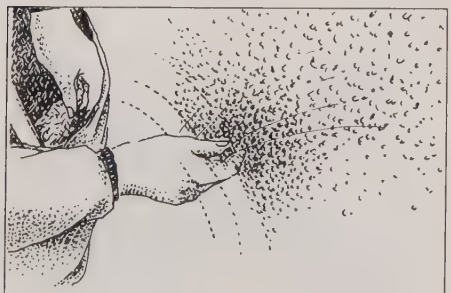
LAWN MAINTENANCE

Mowing

Frequent mowing ensures vigorous growth, and a quality lawn. Leaving the clippings on the lawn will increase drought resistance and helps recycle nutrients. However it is likely to impede aeration, encourage earthworms and spread weeds, and the lawn will tend to become spongy and more susceptible to disease.

Fertiliser

Lawns need a regular application of fertiliser to replace nutrients removed during mowing. Underfed lawns are pale in colour, have a sparse loose texture and are easily invaded by weeds. Gro-Plus Lawn Fertiliser (13.2.2 plus iron) has been specifically blended for use on lawns. The high nitrogen content stimulates leaf growth. The iron content promotes a rich green colour and increases soil acidity which inhibits growth of coarse grasses and weeds and discourages earthworms. Apply in spring and autumn at a rate of 30g per square metre, and water well. It is not normally necessary to apply lime to lawns.



Broadcast fertiliser evenly. Water in.



Fill minor hollows with peat or soil, and sow.

Top Dressing

Top dressing is the application of a layer of peat, soil or sand to the lawn surface. Its purpose is to fill in minor hollows, help

ESTABLISHING A NEW LAWN

Thorough preparation is the key to establishing a good lawn. Preparation should start at least two months before sowing time.



ELIMINATE WEEDS

Clear weeds, stones and other debris. Difficult weeds, i.e. kikuyu, couch and paspalum need to be treated with a weedkiller such as Roundup. Spray weeds when in plenty of leaf. Cultivate soil two or three weeks later.

PREPARING SOIL

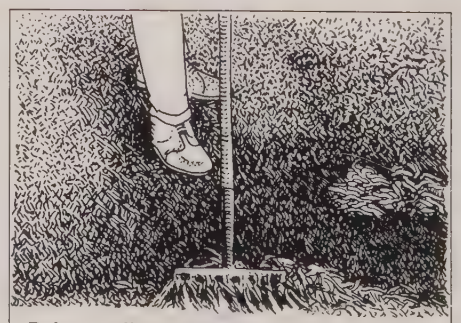
Carry out any major contouring required to ensure there are no low spots where water may lie. Cultivate the soil (dig or rotary hoe) when damp, to a depth of 10cm, and prepare to a fine, crumbly tilth. Additional topsoil may need to be added, especially if on a new subdivision. Work in a base dressing of Gro-Plus General Garden Fertiliser at a rate of 100g per square metre (2 handfuls). As lawns prefer acid soil, lime is generally not necessary, except on heavy clay soil. Level and consolidate by trampling, raking and/or using a levelling bar or flat board.



build up a good soil layer and encourage a denser grass growth. Top dressing should be done annually.

Grooming

Over time, lawn grasses will become matted and the soil compacted. A layer of thatch (old undecomposed roots) builds up, which weakens new growth. Raking the lawn will remove it. In addition spiking the lawn with a garden fork will increase air circulation, improve drainage and ease soil compaction.



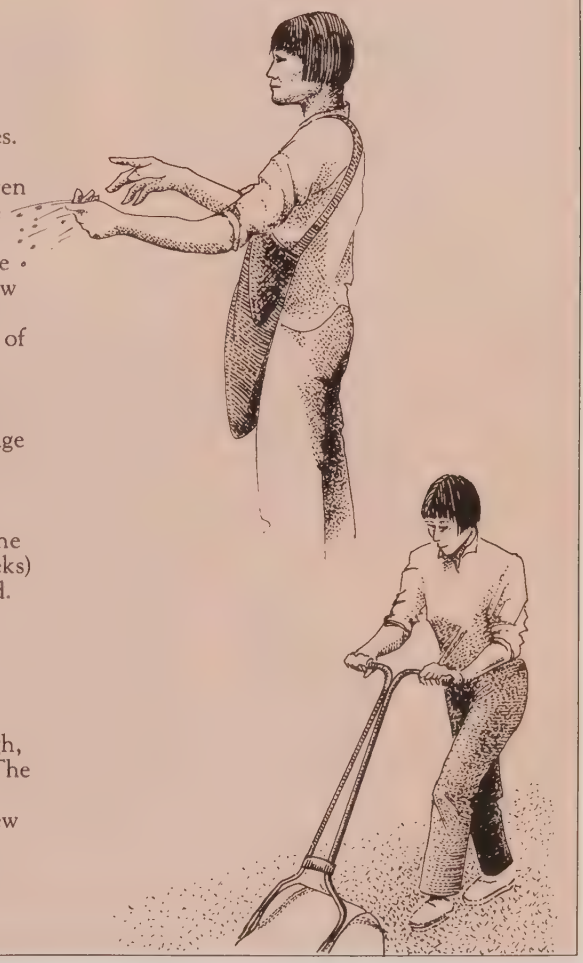
Raking will remove old roots

SOWING SEED

Seed is best sown in spring or autumn, when temperatures are warm and there is plenty of moisture.

Divide the seed into two halves. With fine seed, mix with equal parts of fine sand to make an even distribution easier. Take half the seed, and scatter walking in a north/south direction. Then take the other half of the mix and sow walking in east/west direction. Throw the seed, giving it plenty of air. Let it trickle between the fingers as the throw is made, making a long sweeping spread. This ensures a more even coverage of seed.

After sowing, lightly rake to cover the seed with soil. Keep moist with light watering until the seeds germinate (two to four weeks) and seedlings are well established.



MOWING

Mow when grass is 4 to 5cm high, lightly roll and mow the lawn. The first cut should just sever the growing tips. This encourages new shoots at the base of the plant. After three to four cuts reduce cutting height.

Weeding

The best way to prevent weeds invading a lawn is to have a thick, vigorous cover of grass. This can be maintained by frequent mowing, regular watering and fertilising. A few weeds are easily eliminated from lawns by cutting the roots just below the soil surface with a sharp knife. If they become a major problem in a well established lawn a selective weedkiller can be used. Broadleaf and clover-like weeds can be controlled with the use of Turfix or Woody Weedkiller. These chemicals are very selective in their action and do not harm grasses. Trigger Lawn Weeder, which is ready to use, avoids the hassle of mixing and is ideal for spot treatment.

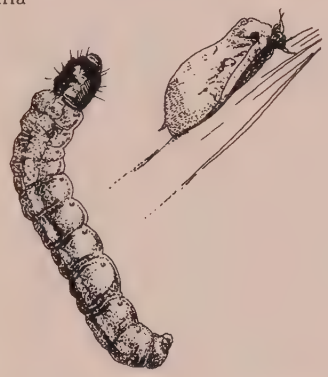
If Onehunga Weed (the weed that produces prickles in the summer) is a specific problem, Faneron provides excellent control. Apply in spring when the soil temperatures have warmed (to 20°), but before the weed sets seed. In early spring when temperatures are still cool, use Turfix.

Grass weeds such as paspalum, couch and kikuyu need to be spot sprayed with a systemic grass killer, e.g. Roundup. For most successful results, spray during periods of maximum growth in spring and autumn.

Moss in lawns may be a problem in badly drained or compacted soil and in shady situations. Raking the area throughly and watering in a solution of sulphate of iron (10g/sq metre) will kill the moss quickly. If possible drainage should be improved and shade eliminated. Alternatively, some other ground cover such as ivy or ajuga can be grown, or a 'moss' lawn cultivated!

Watering

To keep grasses actively growing over the summer it may be necessary to water in some areas. Lawns should never be allowed to dry out completely. Keep them well watered, making sure the moisture penetrates to a depth of 20cm. For

LAWN PESTS			
Pest	Symptoms	Most Obvious	Control
Earthworms 	'Wormcasts' or small mounds of soil are left on surface causing unevenness and reducing stability of the lawn.	During autumn rains. During winter until spring.	Carbaryl Keep lawns acidic (pH5–5:5). Do not lime. Remove grass clippings.
Porina 	Feed on grasses, chewing them off at ground level. They do not eat roots. Leave tunnels (about diameter of 1–2mm) and soil casts with silken threads. Grub is a grey colour with dark head; grows up to 6 cm.	February-April	Granular insecticide (Lawn Doctor or Diazinon) applied in autumn or spring. (Do not apply in frosty weather as grubs will be inactive).
Grass Grub 	Grubs feed on roots causing yellow patches and stunted lawn growth. Adult beetles feed on foliage taking notch-shaped bites and can cause considerable damage on ornamentals in November.	Autumn, early winter.	Lawn Doctor applied in autumn or more effectively in spring as the adults are emerging.

convenience and uniform application of water, Plassay Pop up sprinklers should be considered.

Re-seeding

Bare patches may occur on compacted soil as a result of heavy traffic on lawns. These are easily remedied by first giving the soil a good watering, loosening the top 10–15cm with a garden fork, scattering seed over the area and then raking to cover the seed with soil. 'Patching packs' are ideal for this purpose.

PESTS OF LAWNS

THERE ARE few pests of lawns, but those commonly found can be difficult to control as they spend much of their life cycle underground. For effective control it is necessary to correctly identify the pests and have a knowledge of their life cycles and habits. The three key pests of lawns are outlined in the chart.

DISEASE CONTROL IN LAWNS

TURF DISEASES can be encountered throughout New Zealand but fortunately are not common. Some are listed in the chart.

ALTERNATIVE LAWNS

Dichondra

Dichondra repens or Mercury Bay weed is a native of New Zealand. It is a popular alternative to grass lawns, particularly in the warmer northern areas where it establishes quickly and fine grass lawns are more difficult to keep.

The main advantage of dichondra lawns is that they require little, if any, mowing. In full sun, dichondra gives a soft, almost shagpile effect. In shady areas where the growth tends to be lanky, some mowing may be necessary. Dichondra is ideally suited to contoured or undulating lawn areas where mowing is difficult.

Thorough preparation is essential before planting dichondra, preferably in light, free draining soils. Incorporating peat into more difficult heavy soil types will be beneficial. Difficult weeds such as kikuyu, paspalum and couch should be removed with Roundup or other systemic grass killer.

LAWN DISEASES

Name	Symptoms	Controls
Fusarium	Small patches of 'cobwebs' appear which show up in early morning dew. Leaves turn yellow and later brown. High levels of nitrogen (especially if applied in organic form e.g. urea, dried blood) favour disease development as does high humidity.	Good drainage should be provided. Thatch and plant debris should be thinned and removed to reduce humidity. Heavy dressing of nitrogen should be avoided in winter. Fungicides, Benlate and Manzeb will assist control.
Brown Patch	Irregular patches of purplish/green coloured grass which later turn light brown. Prevalent from spring until autumn in warm moist conditions and under high nitrogen levels.	Excessive use of readily available nitrogen should be avoided. Fungicides Bravo and Manzeb assist control.
Red Thread	Distinctive bright 'red threads' are readily seen on infected turf. Favoured by warm temperatures and humid conditions.	Increase soil fertility and apply Manzeb.

Spring, when the soil temperatures begin to rise, is the best time to sow dichondra seed. Germination takes from 5 to 30 days, the warmer the soil temperature the quicker the germination. In northern districts where moderate winter temperatures are experienced, late summer and autumn are also suitable for sowing, as the dichondra will continue to grow through the winter.

Ten grams of seed per square metre gives a good cover in five weeks. Rates as slow as 3g per square metre can be used but total ground cover may take three months. Bulk the seed up with sand, sow in alternate directions and rake seed into the top 1cm of soil. Firm the seed bed down.



Dichondra

As the seed bed is germinating keep it well watered. Drying will cause uneven and slow germination. A light mulching with peat will minimise the water loss and

GROWING A DICHONDRA LAWN

FROM PLANTS

Grass lawns can be converted by oversowing seed or by transplanting dichondra plugs at regular spacings (approximately 15cm each way). A nursery bed for production of plugs can be established by sowing seed in a small area. Plugs can then be transplanted.





RUNNING STRIPS

A slower but economical method is to establish dichondra in a narrow strip, along one edge or through the centre of a lawn. Alongside the established dichondra another strip (0.5m wide) can be prepared. The dichondra will run and colonise the prepared strip. A further strip can then be prepared. This method may take two or three years.

encourage germination as well as suppress some weeds.

Buffalo Grass
A coarse grass which is useful in very dry sandy beach properties. It is established by taking runners from plants. Frequent mowing is necessary to prevent a thick spongy mat developing.



Buffalo Grass

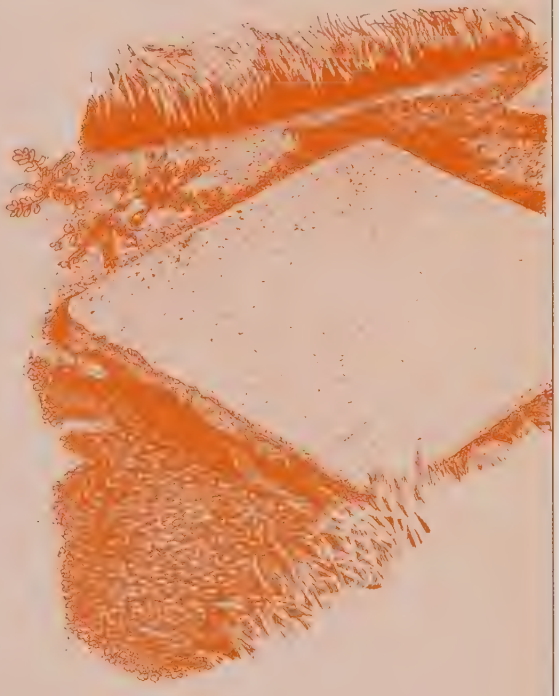
Cotula
There are many different species but for the home garden a low growing species which will need little mowing is most suitable. (The species used in bowling greens tend to be more vigorous and robust.) The small fern-like leaves are pale green in colour. If grown in full sun the lawn will be low and compact. Establish by taking runners or strips from an established lawn.

WEED CONTROL

The most important time for weed control in dichondra lawns is in the establishment stage. Although germinating in 5 to 15 days under warm conditions, the dichondra develops slowly and does not run and form a mat for one to two months, during which time weeds can become a problem. Hand weed during establishment and keep well fertilised to promote vigorous growth.

FERTILISER

Strong growing dichondra lawns not only look attractive but they keep out most weeds as well. Well-fed lawns retain the rich, green colour. Poorly fed lawns will be pale and yellow in appearance and the leaf size will decrease with weeds coming in. An annual dressing of Gro-Plus General Garden Fertiliser in the spring followed by an application of Gro-Plus Lawn Fertiliser at six to eight weekly intervals over the growing period (summer) will maintain a vigorously growing lawn. Leaf burn can be avoided by watering thoroughly after applying fertiliser.



Alternatively, a granulated fertiliser which rolls off the leaves and avoids burning can be used. Apart from initial establishment, liming is not necessary and could result in growth suspension.



Other plants which can be used for making an alternative lawn include thyme, chamomile, hydrocotyle, yarrow and moss.

GROUND COVERS

THE TERM 'ground cover' is commonly used to describe any plant which grows low over the ground. Some species form low carpeting covers, others grow to a metre high with a vigorous sprawling habit and still others form dense clumps. A wide variety of species grow well and it is possible to choose low-maintenance plants with habits and vigour to suit most situations.

Garden Use

The commonest ground cover is grass – versatile, hard wearing and requiring regular maintenance. The green sward of a well-maintained lawn sets off borders perfectly and makes the ideal area for families to play and relax. Other plants can be used as a substitute or partial substitute for grass where maintenance is difficult or conditions for good grass growth unfavourable. Ground covers can be used effectively between trees and shrubs in a border as fillers and to help suppress weeds. Species which layer freely or form clumps help stabilise banks and reduce surface erosion. Low-growing perennials are free flowering, showy and ideal for the fronts of large borders. Some provide low maintenance cover, e.g. gazanias; whilst others provide cover over the summer and are cut back to root clumps over the winter, e.g. nepeta; and others are best renewed every year or two, e.g. verbenas. Annuals are often useful as temporary cover.

Woody plants need low maintenance and are reliable though less showy, e.g. conifers. In larger gardens, ground cover plants are most effective when planted in bold groups; in smaller gardens there may be room for only one plant of each species unless dwarf forms are chosen.

Cultivation

Thorough, initial preparation will result in good plant growth and low maintenance. Eradicate all perennial weeds and if poorly drained, add good quality topsoil to raise the area.

Choose species which are suitable for the site; some thrive on hot, dry banks, some require full sun to flower freely, others tolerate shade. Most plants require occasional pruning to maintain an attractive shape. A light application (50g/m^2) of Gro-Plus General Garden fertiliser in early spring will keep plants healthy and is essential for flowering perennials. Take off dead heads and groom flowering plants to prolong the flowering season.

Reliable Ground Covers

The following are low-growing plants suitable for the smaller garden. The numbers following each description give the height and then the width of each plant, in centimetres.

Ajuga reptens: perennial, best in partial shade, blue flowers in spring. 10 x 60

Coprosma 'Hawera': dense cover, tiny leaves and light brown stems.

Cacerosa hybrid: 10 x 60

Coprosma 'Te Puna': dense cover, tiny leaves, lime-green appearance. 20 x 120

Cotoneaster 'Lynda': woody with small dark-green leaves. 10 x 60

Gazania linearis 'Flore Plena': spreading habit, bright yellow double flowers from spring until winter. Suits sunny dry banks; other forms and colours available. 15 x 90

Hedera helix 'White Diamond': dense, sprawling habit, white/green variegated leaves. 30 x 90

Juniperus communis 'Depressa Aurea':

dense conifer, lime-green spring growth turns gold. 30 x 90

Lampranthus (iceplant): perennial, thrives on hot, dry banks. Spectacular display in spring. 30 x 60

Lithodora diffusa (syn Lithospermum): perennial, bright blue flowers in spring. 10 x 60

Pelargonium 'Mini-Cascade': sprawling mini ivy geranium, red and pink. Frost tender. 20 x 60

Stachys byzantina (lamb's ear): clump-forming perennial with silver foliage. 10 x 30

The following are larger plants suitable for more extensive areas.

Agapanthus africanus: clumping, dwarf form, blue flowers over long period in summer. 50 x 90

Arctotis: vigorous, sprawling habit, grey-green foliage. Thrives on hot, dry banks. Several flower colours. 30 x 180

Arthropodium cirratum (Reinga lily): clumping habit, grows well under trees, white flowers in spring. 60 x 90

Ceanothus gloriosus: dense cover, dark green leaves, blue flowers. 30 x 180

Coprosma X *kirkii* 'Goldstream': vigorous, sprawling habit dark-gold stems. 30 x 90

Drosanthemum hispidum (ice plant): profusion of small, mauve flowers in summer. Ideal for banks. 10 x 180

Grevillea prostrata 'Aurea': needs full sun and good drainage. Yellow flowers in spring. 10 x 90

Grevillea tridentidfera biternata: vigorous grower, mid-green leaves, requires clipping to keep low. Suits sunny, dry banks, damaged by heavy frosts. 50 x 150

Hedera canariensis 'Variegata': has a yellow-white edging to leaves. Vigorous. 30 x 120

Hedera helix: ivy with small leaves, prefers partial shade in hot areas. 30 x 120

Helichrysum argyrophyllum: small, silver leaves, sprawls over rocks and banks. Small yellow everlasting flowers in summer. 10 x 120

Lantana montevidensis: dense cover, bright mauve flowers over summer. Frost tender. 30 x 180

Juniperus taxifolia lutchuensis: dense, sprawling habit, mid-green foliage. 30 x 180

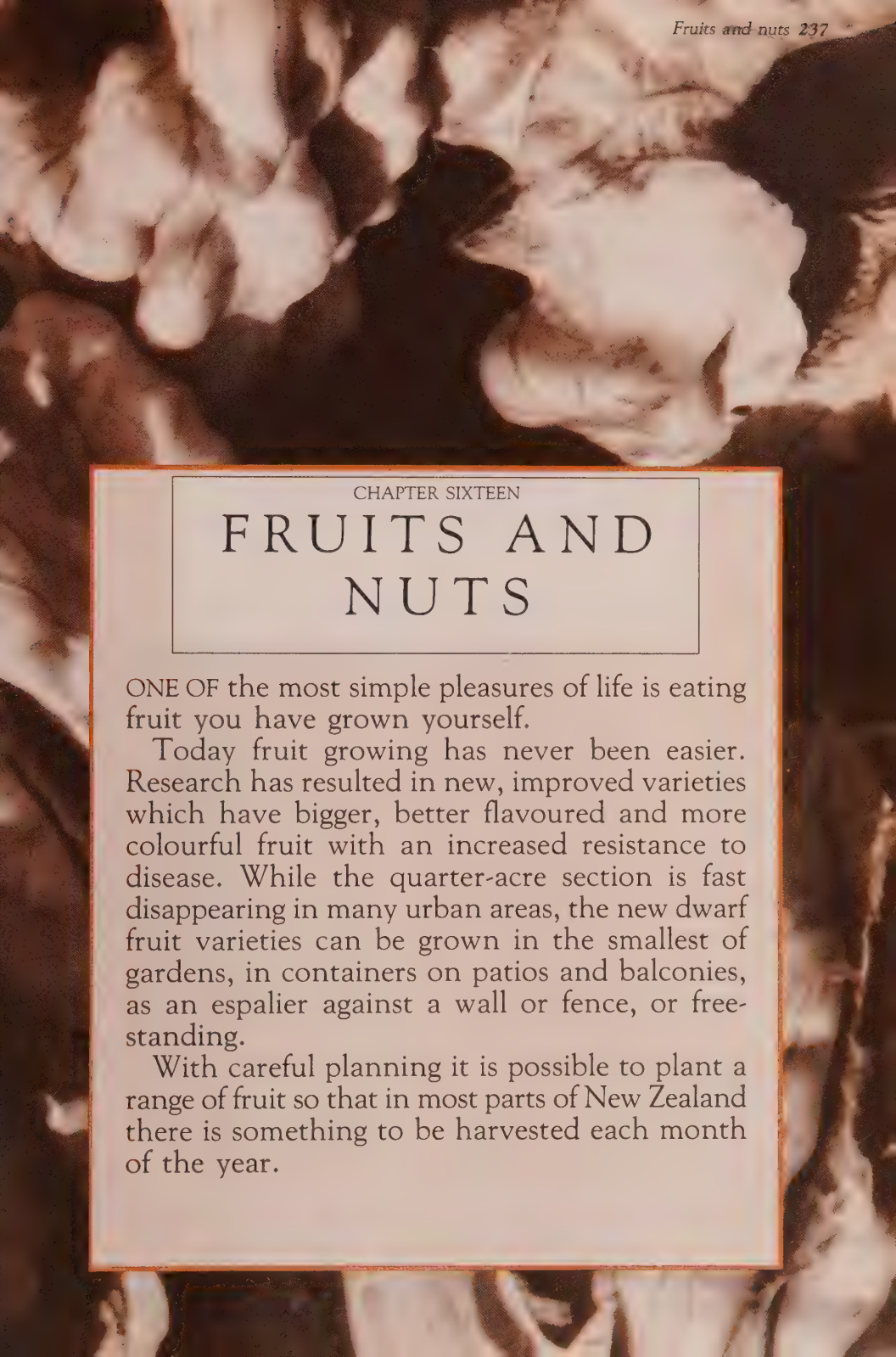
Myoporum parvifolium: sprawling habit, small dark green leaves. 10 x 180

Osteospermum: vigorous, sprawling perennial. Thrives on hot, dry banks. Daisy flowers in spring; white, mauve, purple. 30 x 100

Pelargonium peltatum (ivy geranium): vigorous, sprawling habit. Flowers spring to autumn, frost tender. 30 x 180

Rosmarinus lavandulaceus: sprawling habit; profusion of mid-blue flowers in winter. 30 x 120





CHAPTER SIXTEEN

FRUITS AND NUTS

ONE OF the most simple pleasures of life is eating fruit you have grown yourself.

Today fruit growing has never been easier. Research has resulted in new, improved varieties which have bigger, better flavoured and more colourful fruit with an increased resistance to disease. While the quarter-acre section is fast disappearing in many urban areas, the new dwarf fruit varieties can be grown in the smallest of gardens, in containers on patios and balconies, as an espalier against a wall or fence, or free-standing.

With careful planning it is possible to plant a range of fruit so that in most parts of New Zealand there is something to be harvested each month of the year.

CHOOSING YOUR PLANTS

THE CHOICE of fruit to be grown is influenced by climate, site, space and soil. Every plant has a built-in preference for a certain set of climatic conditions. Some plants, e.g. apricots and currants, require a number of hours of winter chill before their fruit buds will develop and set good fruit. Such fruits do not do well in warmer parts of the country. Other plants like pawpaw and babaco require a warm spring and plenty of summer moisture. Grapes and figs which ripen in autumn do best in areas with a long dry summer.

Sun and shelter are the foremost requirement. The best sites in the garden should be reserved for fruit trees if they are unlikely to do well elsewhere. Some fruits are more tolerant of poor soil conditions than others, but generally, the better the soil, the better the results. (For improving soils see the chapter on soils and water.)

As most home gardens have very limited space for fruit trees, it is important to plan a layout and select fruits that will yield best in the particular soil type and climate. Avoid growing fruits that are unsuited to a soil type or climate: i.e. citrus should not be planted in cold exposed sites, while cherries, apricots and currants are not so suitable in warm humid climates. Kiwifruit and passionfruit need a free-draining soil while stonefruits are more tolerant of damp soils. The following table shows the winter temperature tolerance of common fruit.

WINTER TEMPERATURE TOLERANCE			
	Mild Winters	Moderately Cold	Cold Winters
Pineapple	●		
Tamarillo	●		
Babaco	●		
Passionfruit	●		
Banana	●		
Cherimoya	●		
Casimira	●		
Feijoas	●		
Kiwifruit	●		
Mountain Pawpaw	●		
Loquat	●		
Avocado	●		
Mandarin	●		
Orange	●		
Grapefruit	●		
Lemon	●	●	
Peach	●	●	●
Nectarine	●	●	●
Apple	●	●	●
Pear	●	●	●
Quince	●	●	●
Plum	●	●	●
Strawberry	●	●	●
Gooseberry		●	●
Loganberry		●	●
Boysenberry		●	●
Blueberry		●	●
Apricot			●
Cherry			●
Raspberry			●
Currant			●

MONTHLY HARVESTING OF FRUIT

January
Apples, peaches, plums, apricots, cherries, avocado, lemon, blueberries, boysenberries, strawberries, currants rhubarb, pears, Asian pear, cherries and babaco.

February
Peaches, nectarines, plums, apples, pears blueberries, blackberries, strawberries, melon, avocado, lemon, grapes, Asian pear, apricot, babaco.

March
Peaches, nectarines, plums, apples, pears, blackberries, melon, grapes, lemon, avocado, Asian pear, fig.

April
Apples, pears, quinces, tamarillo, feijoa, guava, passionfruit, fig, melon, lemon, hazelnut.

May
Apples, pears, quinces, tamarillo, feijoa, guava, fig, persimmon, lemon, macadamia, walnuts, kiwifruit.

June
Apples, kiwifruit, tamarillo, feijoa, lemon, avocado, persimmon.

July
Mandarin, grapefruit, lemon, kiwifruit, tamarillo, avocado.

August
Mandarin, grapefruit, lemon, orange, tamarillo, avocado.

September
Mandarin, grapefruit, lemon, orange, tangelo, tamarillo, avocado.

October
Avocado, strawberries, orange, tangelo, Wheeny grapefruit, mandarin, loquat.

November
Gooseberries, strawberries, orange, tangelo, mandarin, cherries, avocado, loquat.

December
Raspberries, loganberries, blueberries, strawberries, apricot, cherries, avocado, babaco, loquat.

BERRY FRUIT

Brambles: Blackberries, Boysenberries, Dewberries, Loganberries

These cane fruits are easy to grow in most parts of New Zealand, as they are tolerant of a wide range of soils and climates. They require a fence 1.5 to 1.8 metres high on which the canes can be trained. Plants are usually available between July and December and are planted 1.5 metres apart. During the first year they produce canes from which fruiting spurs will emerge in the second year. Fruit ripens late November for loganberries, late December for boysenberries, and January to February for dewberries and blackberries. Immediately after fruiting the old canes can be cut away. Care should be taken not to damage the new ones coming away from the base. The new canes are tied up on the fence and will carry the next year's crop. Fertilise in spring with 100–300 grams (three to five handfuls) per plant of Gro-Plus Citrus fertiliser.

The following spray programme can be used as a guide to control major pests and diseases.



Blueberry

This fruit is a member of the Heather (Erica) family and requires an acid free-draining soil. Whilst blueberries prefer winter chilling, they will grow in all parts of New Zealand providing they have an open soil with plenty of organic matter. Blueberries grow as a bush two to three metres high and fruit is carried on the previous season's wood. Pruning aims at

BERRY FRUIT SPRAY PROGRAMME		
Time	Material	Pest/Disease
Winter	Copper Oxychloride + Conqueror Oil	
Bud burst	Copper Oxychloride	Cane spot, cane wilt
Pre blossom	Bravo® + Orthene®	Cane spot, cane wilt, brown beetle, leaf roller
Petal fall – 7 days before harvest	Bravo® + Carbaryl	Downy Mildew, Botrytis, Caterpillars
Immediately after harvest	Bravo® + Orthene®	Cane spot, bud moth, spur blight

getting rid of old wood and maintaining an open bush and should be carried out in winter. Apply 100–200 grams (three to four handfuls) per bush of Gro-Plus Citrus fertiliser in early spring. It is important that blueberries be kept watered in summer. High bush varieties such as Stanley, Atlantic, Jersey, Dixie and Berlington are self fertile. Rabbiteye varieties are more suited to northern areas as they do not require winter chilling. However, they require cross pollination and more than one variety is required.

Blueberries are relatively free from disease, but leafroller caterpillars can cause a problem. Control with Carbaryl. Birds attacking the fruit as it ripens are a major problem and bushes should be protected with bird netting. Blueberries fruit between December and March.



Cape Gooseberry

A member of the tomato family, the Cape Gooseberry grows well anywhere that tomatoes can be grown outdoors. It is a perennial, forming a bush about a metre high, but is best grown as an annual each year. The berries which are golden when ripe are carried singly inside a husk which changes from green to transparent as the berry ripens. Cape Gooseberry is a popular dessert fruit and is used in jams.

Plants may be grown from seed or cuttings, and germinate readily from seed extracted from the berry each year. A single plant will produce a half to one kilogram of fruit in a season. Sow in early spring in containers. Plant out when frost danger has passed.

Pruning is not necessary, but the plants may need support with stakes or alternatively be tied to a fence.

Cape Gooseberries are attacked by the same pests and diseases as tomatoes. Aphids, green vegetable bug, whiteflies, tomato stem borers, caterpillars and red spider mite can all be a problem. Spray with Target and Mite killer. Sclerotinia, botrytis and grey mould can be troublesome diseases in a wet season: spray with Bravo.



Currant

The hardiness of currants makes them ideal fruits to plant in cooler South Island situations. They do not succeed in warmer areas as they require winter chilling to produce good crops. Most popular with the home gardener is the black currant which prefers cool, damp conditions. A well grown black currant bush may reach 1.5–2 metres high and will last for many years, yielding around 4 kg per year.

Currants fruit during December and January. Black currants fruit on wood grown the previous season. Prune out old wood immediately after fruiting to encourage new growth. Cut back old fruiting branches to a strong shoot and aim at reducing the size or bush by about ⅓.

CURRANTS AND GOOSEBERRIES SPRAY PROGRAMME		
Time	Material	Pest/Disease
Late July	Conqueror Oil	Scales, mites
Bud movement	Copper Oxychloride	Leaf spot
Pre blossom	Copper Oxychloride Orthene ®	Fungous diseases Caterpillars
Post harvest	Copper Oxychloride	Clean up of fungus

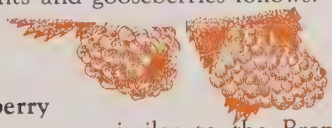
Red and white currants differ from black currants in that they produce much of their fruit on spurs on older wood.

Major pests are leafroller caterpillars and mites. Spray with Orthene and Mite Killer.



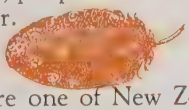
Gooseberry

Gooseberry fruit grows well in all but the heaviest clay soils and in most climates, but will fruit best in cold winter climates. Gooseberries fruit in November on spurs. Whilst fruit is produced for several years on old wood, the best fruit is produced on younger wood. Old shoots should be cut out as they age and replaced with new ones. Remove strong upright shoots in the centre of the bush, and shorten or remove criss-crossed growth. Fertilise in early spring with (100 grams) two handfuls per plant of Gro-Plus Citrus Fertiliser. The spray programme for currants and gooseberries follows.



Raspberry

A cane crop, similar to the Bramble group except that they do not necessarily need a fence for support. They fruit better with winter chilling, producing their crop in December on canes grown the previous year. They should be fertilised in early spring with 100–300 grams (three to five handfuls) per plant with Gro-Plus Citrus Fertiliser.



Strawberry

Strawberries are one of New Zealand's most popular berry fruit and are grown in most parts of the country. Strawberries are a herbaceous perennial which grow from a leafy crown. They send out runners in all directions which develop leaf clusters and roots and become new plants.

Strawberries are best planted in new soil. The area should be dug over in the autumn with plenty of compost or peat and four to five handfuls per square metre of Gro-Plus General Garden fertiliser. The strawberry bed is best raised in a mound above the surrounding soil and covered with black polythene. This has the advantage of giving positive weed control and keeping the fruit clean.

Strawberry plants are available about May and can be planted through holes in the polythene making sure that the crown is not buried deeply. Best varieties for the northern areas are Tioga and Cambridge Favourite, while Red Gauntlet is favoured in the southern areas where it can be left for two years' cropping.

Regular watering is necessary during the growing season, but it should be kept off the ripening berries to discourage botrytis and grey mould. In the home garden it is usually necessary to cover strawberries with bird netting as they approach ripening. The early spring flowers should be removed until the plant has made considerable leaf growth, though this is not usually necessary in the southern area. Runners should be removed from plants which are being retained for a second season.

The following spray programme can be used as a guide to control major pests and diseases.

CITRUS FRUITS

CITRUS FRUITS require a warm climate with a free-draining soil and do best in

STRAWBERRY SPRAY PROGRAMME		
Time	Material	Pest/Disease
August/September	Bravo® Conqueror Oil	Leaf spot Red Mite
Pre blossom and fortnightly	Bravo®+ Benlate Pestmaster	Botrytis, septoria and alternaria leaf spot

the northern half of the North Island. Meyer lemons and grapefruit will withstand cooler climates once established.

Even in the smallest gardens citrus trees find a place because they require little attention, virtually no pruning and very little spraying. Their evergreen nature, glossy foliage, perfumed blossoms and bright coloured fruit in winter add to their overall ornamental value.

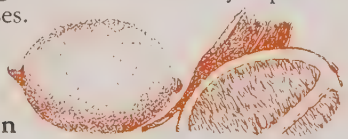
The main requirements of citrus are sun, summer moisture, a free-draining soil and protection from strong cold winds. Most citrus fruits are grafted onto trifoliata root stock which is more disease resistant and tends to produce a more compact tree which matures more quickly and often produces more fruit.

Citrus require heavy applications of fertiliser. Depending on their size, apply 1–5 kg per tree of Gro-Plus Citrus fertiliser split into three applications in October, December and February.

Citrus trees have a fibrous surface rooting system. A mulch of compost, peat or granulated bark over the root zone area will help to retain soil moisture, but care should be taken to keep the crown or base of the trunk clear to avoid collar rot disease.

Citrus require minimal pruning. Thick growing varieties such as some mandarins may require opening up occasionally while others such as lemons require keeping in shape by cutting back long single stems. This is best done at harvest time.

The following programme can be used as a guide to control major pests and diseases.



Lemon

Meyer lemons are the hardiest of the citrus group. The tree is compact and the fruit crops early, making it a popular variety. The fruit is medium sized, smooth skinned and produced mainly in winter/spring, but lemons can usually be picked most of the year. Unlike most other citrus crops, Meyer lemons are commonly grown from a cutting, on their own roots.

Eureka, Genoa and Villa Franca lemon varieties produce mainly in summer, while Lisbon, which has more thorns than the others, is mainly winter cropping.



Grapefruit

Morrison Seedless or its improved counterpart Golden Special is the well known New Zealand grapefruit. The skin is golden and the flesh orange and it ripens in July and continues into October. When grown in close proximity with other citrus, it will cross-pollinate fairly readily and the fruit will bear seeds.

Wheeny grapefruit is a large pale yellow variety. It is a juicy fruit and requires warmer conditions than the New Zealand grapefruit. Wheeny ripens from October to January. There is a tendency for Wheeny to produce heavy and light crops alternately. Heavy puckering of the leaves ia a natural condition of this variety and not due to disease.

The clear-skinned American grapefruit types do not grow well under New Zealand conditions.



Mandarin

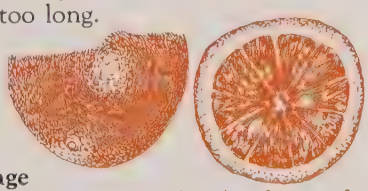
A popular citrus because of the attractive heavy crops of easily peeled sweet fruit. Trees begin cropping at an early age and

CITRUS SPRAY PROGRAMME		
Time	Material	Pest/Disease
October	Copper Oxychloride + Orthene ®	Verrucossis, melanose, Aphids
November petal fall of main blossom	Copper Oxychloride + Orthene ®	Verucossis Aphids
December (after flowering)	Copper Oxychloride + Orthene ® + Conqueror Oil	Verrucossis Aphids, scale Red mite, mealy bug
February	Copper Oxychloride + Orthene ® + Conqueror Oil	Verrucossis Aphids, scale Red mite, mealy bug
April	Copper Oxychloride + Orthene ®	Verucossis Aphids, mealy bug
May	Copper Oxychloride + Orthene ®	Verrucossis Aphids, mealy bug
June	Copper Oxychloride	Verrucossis

can be controlled to a relatively small size. They make ideal container specimens and brighten up a winter garden as the fruit ripens. Satsuma Silver Hill is the easiest to peel and the earliest to ripen (July), but has a short season.

Clementine is probably the best all round variety, being compact with reliable heavy crops of medium sized fruit of good flavour. Ripens late July to September

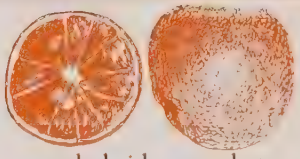
Burgess Scarlet, Thorney and Tara are late varieties ripening from September to December. They tend to have more flavour, but are lower yielding and have a tendency to become dry if left on the tree too long.



Orange

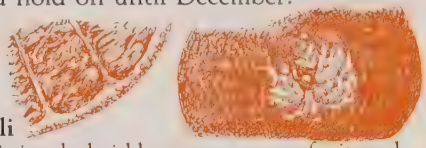
Oranges are the least hardy of citrus fruit and require perfect soils and a warm climate.

The main home garden variety grown in New Zealand is the Carters or Washington Navel which ripens from early August to September. Best Seedless and Ruby Blood are mid-season varieties, ripening from September to November, while Harwood Late or Valencia ripen in November/December.



Tangelo

Tangelos are a hybrid cross between mandarin and grapefruit and they are intermediate in character between the two. The major variety grown in New Zealand is Seminole which bears heavy crops of large attractive thin-skinned flavoured fruit. They ripen in September and hold on until December.



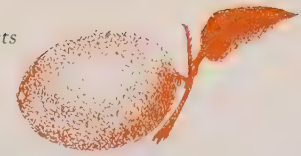
Ugli

This is a hybrid between a grapefruit and mandarin of Jamaican origin. It is a large thick-skinned pale orange fruit, ripening in August through to September. It is sweet and peels easily.

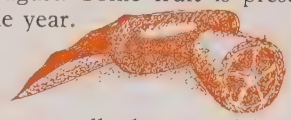


Lime

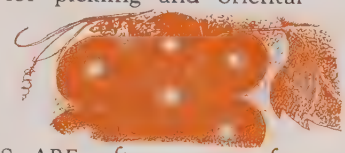
The Tahitian lime is probably the most suitable for home gardens. It is similar in appearance to a lemon with smooth skin and high flavour and acidity. It ripens in August/September and should be picked and used immediately as the fruit do not keep well. Ripe fruit drop to the ground.



Lemonade
This is a dessert-type lemon which ripens June to August. Some fruit is present most of the year.



Kumquat
The trees are small, dense and highly ornamental making ideal tub and container plants. They are relatively hardy and produce heavy crops of golden fruit which are eaten whole, skin and all. They make excellent marmalade and are often used for pickling and oriental cooking.



GRAPES

GRAPEVINES ARE often grown for ornamental purposes as well as for their fruit. They can be grown in most parts of New Zealand, but areas which suffer from late spring frosts may have difficulty.

Grapes are tolerant of most soils and will grow well in all but the heaviest clays and the lightest sands. They are a climbing plant and can be trained in various ways. The most common training in home gardens is on an espalier system, on a fence or as a canopy over a pergola.

Early pruning aims at establishing a strong framework of four or six leaders. Grapes fruit on the current season's growth, so once the framework is complete, cut back each year in winter to leave two buds on each lateral off the main stem. If there are too many laterals, some may be removed so that there are lateral stubs left every 40–50cm along the leader. After five or six years it may be necessary to replace leaders. This is best done by cutting out and replacing one leader each year so that there is an ongoing replacement.

Seneca: best early season variety. Vigorous. Yellow white berries mild in flavour.

Chasselas Rosé: mid-season variety. Medium to large fruit with pink translucent skin. Juicy.

Golden Chasselas: heavy crops, round berries.

Niagara (White Albany): hardy vigorous white grape. Large berries form in small compact bunches.

Albany Surprise: late variety and one of the most widely grown. Large blue/black berries with aromatic flavour.

Muscat Hamburg or Black Muscat: vigorous late variety. Berries are light coloured, oval in shape with a pronounced muscat flavour.

An annual maintenance dressing of Gro-Plus Citrus Fertiliser (250g per plant) is necessary for grapevines.

Thinning of bunches should be undertaken as soon as the fruit are larger than a pea. Narrow pointed scissors are preferred for this task, but take care not to injure the fruit retained on the vine. Remove small, weak and inferior berries from the bunch and leave about a pencil thickness between berries.

The following spray programme can be used as a guide against most common pests and diseases.

GRAPE SPRAY PROGRAMME		
Time	Material	Pest/Disease
August	Copper Oxychloride + Conqueror Oil	Scales, mites Mildew, black spot
Bud swell	Copper Oxychloride + Orthene®	Scales, mites Mildew, black spot
Bud burst, pre blossom, post fruit set and at 14 day intervals	Bravo®	Downy mildew, powdery mildew, black spot
Post fruit set	Target®	Leaf roller, aphids, mealy bug

PIPFRUIT

PIPFRUIT is probably the most versatile fruit for home gardens and it grows successfully throughout New Zealand. Apples, pears and quinces are adaptable to a range of soils and crop reliably in most areas. In heavy clay soils, plant on raised mounds with plenty of additional organic matter. On low-lying peat land with a high water table, dwarf trees are more suitable. In dry areas summer watering will be required.

Pipfruits have the advantages of being able to be stored for a period of time. This together with the spread of maturity with different varieties enables the fruit to be enjoyed for seven to eight months of the year.

Dwarf trees are most suitable for the home garden. They fruit better at an early age, and enable several varieties to be grown which will result in a spread of harvest. For best results dwarf trees require a fence or support. They can be grown as an espalier, or a cordon.

Early training of the tree aims at establishing the desired shape. The two common methods of shaping standard trees are the central leader or pyramid and the vase or open centre method, the former being more popular as it takes less

APPLES			
Variety	Type	Ripening Period	Appearance
Lord Nelson	Cooking	January	Large striped
Scarlet Pimpernel	Dessert	January	Small red
Oratia Beauty	Dessert/cooking	January	Large striped red
Akane	Dessert	January	Small red
Lobo	Baking	January	Large red
Cox's Orange	Dessert	February	Medium striped
Kids Orange	Dessert	February	Medium striped
Gala	Dessert	Early March	Small striped
Spartan	Dessert	March	Medium red
Jonathan	Dessert	March	Small red
Red Delicious	Dessert	March	Medium striped
Egremont Russet	Dessert	Mid season	Small russet
Freyburg	Dessert	March	Medium golden
Lawfam	Dessert	March	Medium dark red
Golden Delicious	Dessert	Early April	Medium yellow
Fuji	Dessert	April	Large striped
Splendour	Dessert	April	Large red
Telstar	Dessert	April	Medium russet
Sturmer	Dessert/cooking	April	Medium green blushed
Ballarat	Cooking	April	Large green
Braeburn	Dessert	April	Medium striped
Merton Russet	Dessert	April	Small russet
Tydeman's Late	Dessert	April	Medium russet
Granny Smith	Dessert/Cooking	May	Large green

space.

Pruning is a controversial subject but opinions have become considerably more flexible in recent years. Once shape has been established, pruning aims at maintaining an open, disease-free tree, with an even distribution of fruiting spurs. Fruit is carried on fruiting spurs which develop on two-year-old wood.



Apple

Apples are a popular and easily grown fruit with many advantages for the home gardener.

Many apple varieties set more fruit than they can successfully carry and it is not uncommon to see many of the immature fruit fall in early December. Sometimes hand thinning is necessary to avoid overstressing the tree, which may result in a poor crop the following year. However, this should not be done until mid-December when the natural fall is complete.

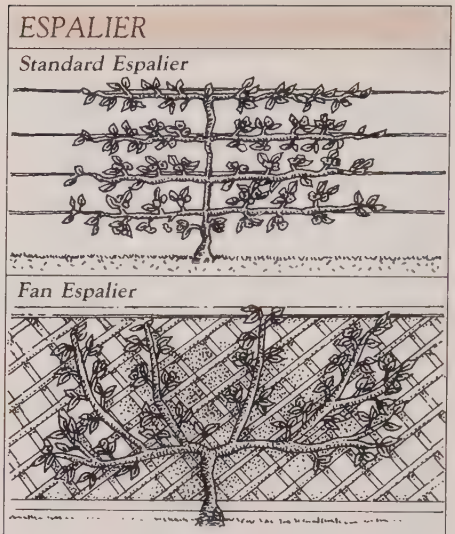
The following spray programme can be used as a guide to control major pests and diseases.



Pear

Pears can be grown throughout New Zealand, but due to the early flowering they can be vulnerable to frost damage in some South Island districts. Pears can take five or six years to come into bearing.

Whilst they will tolerate a wide range of soils including heavy clays, they prefer a well-drained loam. They are also more drought resistant and tolerant of wet soils than apples. A lack of winter chilling in northern districts can affect fruit set. Pears are only partially self fertile and produce better crops when grown with a suitable pollinator (another variety that flowers at the same time).



Espaliered trees can be used to form garden boundaries or clothe walls or fences

PIPFRUIT SPRAY PROGRAMME		
Time	Material	Pest/Disease
Dormant	Copper Oxychloride + All Seasons Oil	All fungous diseases All insects and eggs
Bud swelling	Copper Oxychloride	All fungous diseases
Pink (just prior to flowering)	Saprol®	Black spot
Full bloom	Saprol®	Black spot
Petal fall	Saprol® + Maldison	Black spot, codlin moth
3 weeks later	Saprol® + Carbaryl	Black spot, powdery mildew, codlin moth, leaf curling midge
3 week intervals to harvest	Saprol® + Carbaryl	

PEARS		
Variety	Description	Time of Ripening
Williams bon Chretien	Large sweet fruit with smooth green/yellow skin. Suitable dessert and cooking. Also known as Bartlet. Pollinators: Winter Nellis, Conference.	January/February
Louise vonne de Jersey	A large long pear with a red bronze colouring over green skin. Excellent dessert type. Pollinators: Williams bon Chretien, Winter Nellis, Conference.	January/February
Doyenne du Comice	Dessert type, skin is green/yellow with a brown blush.	February/March
Packhams Triumph	Irregular shaped fruit with a greenish yellow skin, suitable for dessert and bottling. Pollinators: Williams bon Chretien, Winter Nellis.	February/March
Winter Gold	Small dessert pear with russet over a green skin. Pollinators: Williams bon Chretien, Packhams Triumph or Winter Nellis.	March/April
Winter Nellis	A small delicately flavoured pear with a russet over a dull green skin. This is a heavy cropper and the fruit stores well. Pollinators: Williams bon Chretien and Conference.	March/April

Pear trees can be trained in the same way as apples. They bear fruit on short spurs and fruit buds on two-year-old wood.

The same spray programme for apples can be used as a guide to control major pests and diseases.

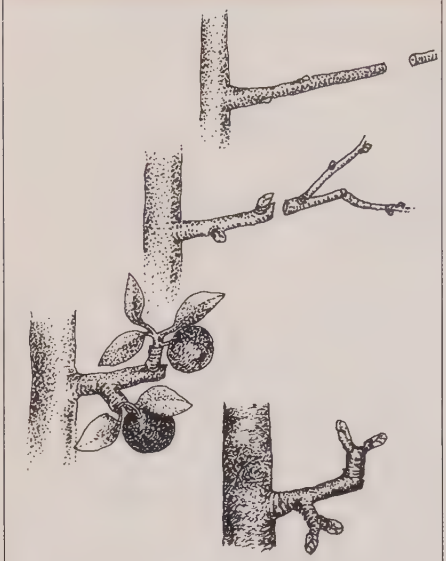


Quince

A popular fruit in the past, this is mainly used in cooking and preserves. Dwarf forms are now available and grow successfully throughout New Zealand. Quinces ripen from March to May. An early season variety is Smyrna, which produces reliable crops of large fragrant fruit with a lemon/yellow skin, ripening in March. The mid season variety of van Dieman which ripens in April seems to be more suitable to the South Island. The fruit is large and has an excellent flavour. The late season variety Champion ripens in May and produces large, round yellow fruit with a delicate flavour. The trees begin bearing when quite young.

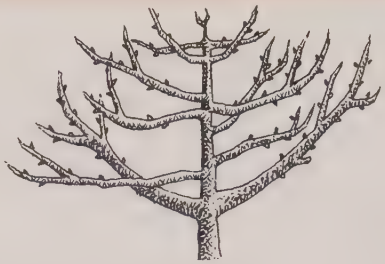
Quinces tolerate most soil types, but do best in a deep rich moisture-retentive soil. They can be trained in the same way as apples and pears, except the fruit is carried on spurs on the tips of the previous summer's growth. Pruning should be aimed at removing weak overcrowded and spindly growth. Any

FRUIT SPURS – Apples

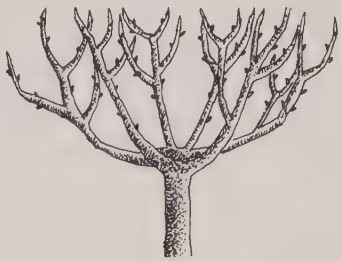


Fruit is carried on fruiting spurs which develop on two year old wood

PRUNING FORMS – apple & pear



THE CENTRAL LEADER – *allow main stem to continue vertically*



THE VASE FORM – *main branches radiate from the main stem pruned to 60cm*

suckers appearing from the base of the tree in early spring should also be removed.

Quinces are susceptible (but less prone) to the same pests and diseases as apples and pears.



Asian Pear – Nashi

Also known as the Japanese Sand Pear due to its gritty texture, the fruit is popular in Japan; in recent years new improved varieties have been introduced into New Zealand. Generally, the Asian pear will grow anywhere apples will grow, but does require shelter from strong winds.

Most Asian pear varieties need pollinators – a common pear variety such as Williams bon Chretien which flowers at the same time as the Asian pear is satisfactory.

The fruit resembles a russet-coloured apple, and has a sweet crisp taste. Different varieties ripen from January through to March.

STONEFRUIT

STONEFRUITS INCLUDE apricots, cherries, nectarines, peaches and plums. When grown on their own roots they all become large trees, but varieties are now available on dwarfing or semi-dwarfing root stock which enables them to be grown in even the smallest gardens. They can successfully be trained on cordons or espaliers.

Peaches are the least cold resistant, while apricots require a greater degree of winter chill and will not crop reliably in warm areas.



Apricot

Apricots prefer a sunny spot sheltered from cold winds, but will tolerate a wide variety of soil types. To fruit adequately, they require cold winter temperatures. The best fruits are produced in the South Island. Apricots fruit between mid-December and February.

Newcastle: early season, producing reliable heavy crops of orange coloured sweet fruit.

Garden Annie (Dwarf): early season, produces medium large yellow fruit. Is self fertile and grows to three metres.

Sundrop: early season. A dessert variety. Suitable for all districts but requires cross pollination with another variety. The fruit is large and the clean yellow skin deepens to the characteristic apricot when ripe.

Roxsburgh Red: early season used for both dessert and cooking, this variety does well in the South Island.

Dundonald: a mid-season variety, suitable for all districts, heavy cropping and suitable for dessert.

Trevatt: late season. A medium sized golden yellow fruit used for dessert or cooking. Suited to the North Island.

Moorpark: late season, produces medium sized fruit suitable for cooking and drying. Suitable for the South Island area only.

Apricots prefer a well limed soil and should be given a maintenance dressing of Gro-Plus Citrus and Fruit Tree fertiliser every year.

Apricots bear fruit on short spurs that form on the previous year's growth and remain fruitful for three or four years before becoming exhausted. Pruning is best done in the summer to avoid silverleaf infection and is directed towards renewal of fruiting wood with the selection of new lateral growth being made each year. To encourage spur development strong laterals can be pruned in summer two or three times.

For control of the main pests and diseases use the stonefruit spray programme as a guide.



Cherry

There are two types of cherry – sweet and sour – the former being mainly grown in New Zealand. Even on dwarfing root stock the sweet cherry tree can still reach a height of 3–4 metres. Sour cherries on the other hand are less vigorous and can be grown successfully in small gardens, and even espaliered. Sweet cherry varieties require a pollinator to be grown near by.

Cherries prefer a climate with cold winter and a hot dry summer. They are most successful in Hawkes Bay and the South Island. Cherries ripen from mid-November to January.

Early Rivers: the main early season variety. Pollinators are Florence and St Margaret.

Tangshi: early season, self fertile red cherry.

Merton Premier: fruits in the early to middle part of the season, firm fleshed and requires regular pruning to main good fruit size. Pollinator is Stella.

Dawson: mid-season and the main commercial variety. Large black fruit with firm flesh. Pollinators: Early River and Stella.

Van: ripens soon after Dawson, black-fleshed variety, pollinator is Stella.

Stella: a large dark-fleshed variety

STONEFRUIT SPRAY PROGRAMME		
Time	Material	Pest/Disease
Dormant	Copper Oxychloride	All fungous diseases
Bud swell	Copper Oxychloride	Leaf curl, bladder plum
Bud burst	Copper Oxychloride	Leaf curl, bladder plum
Full bloom	Saprol®	Brown rot
Petal fall	Saprol®	Brown rot
3 weeks later	Saprol®	Brown rot
3 week intervals to harvest	Saprol® + Carbaryl	Brown rot, oriental fruit moth, cherry pear slug
During leaf fall	Copper Oxychloride	All fungous diseases

which is self fertile.

Florence: late season variety. White fleshed, with a creamy pink blush skin. Requires the pollinator Early Rivers or St Margaret.

St Margaret: late season variety. A firm dark-fleshed variety, needs the pollinator Early Rivers, Florence or Stella.

Cherries bear fruit on spurs which are productive for 10–12 years. They are best grown as a vase shaped tree which suits their arching pendulant habit. Any pruning necessary should be carried out during the summer to avoid silverleaf infection.

Peach and Nectarine

Peaches and nectarines will tolerate a wide range of soil types but are sensitive to waterlogging and prefer well-drained soils. They do best in areas with cold winters and warm dry summers, but grow in most parts of New Zealand.

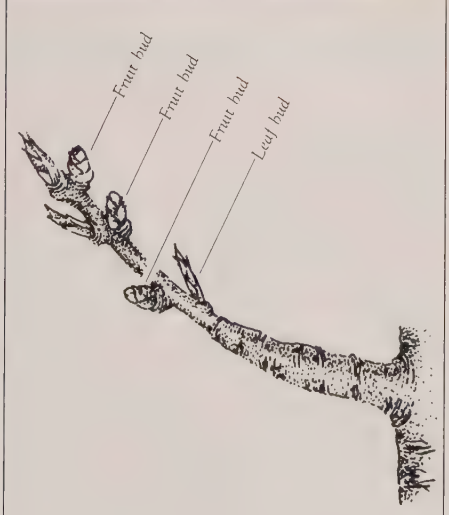
Peaches and nectarines can be grown as a vase shaped tree, trained as cordons or espaliered. Dwarf varieties do very well in containers. As they are vigorous growers, it is important to prune hard in the first year or two to establish a good shape.

They fruit on one-year-old wood.

PEACHES			
Variety	Description	Ripens	District
Springtime	White-fleshed freestone	Late December	All districts
Springcrest	Yellow fleshed semi-freestone	December	All districts
Candor	Yellow-fleshed semi-clingstone	January	All districts
Briggs Red May	Semi-clingstone, white flesh	January	South Island
Dixired	Yellow-fleshed semi-clingstone	January	Not suitable in northern areas
Wiggins	White-fleshed semi-clingstone	January	all areas
Red Haven	Yellow-fleshed semi-clingstone	January	All districts
Glohaven	Yellow-fleshed freestone	February	Not suitable in northern areas
Paragon	Yellow-fleshed clingstone	February	All districts
Halehaven	Yellow-fleshed freestone	February	South Island only
Fayette	Yellow-fleshed freestone	February	All districts
Cresthaven	Yellow-fleshed freestone	February	Not suitable in northern areas
Marys Choice	Yellow-fleshed	March	All districts
Golden Queen	Yellow-fleshed clingstone	March	All districts
Tatura Aurora	Yellow-fleshed clingstone	March	Northern areas
Peacharine	Yellow clingstone	March	All districts

NECTARINES			
Variety	Description	Ripens	District
Armking	Yellow-fleshed semi-freestone	December	All districts
Merton	White-fleshed variety	December	Southern districts
Snow Queen	White-fleshed	December	All districts
Earliblaze	Yellow-fleshed semi-clingstone	December	All districts
Early Lowe	White-fleshed freestone	January	All districts
Independence	Yellow-fleshed clingstone	January	All districts
Flavortop	Yellow-fleshed	January	Colder districts
Red Gold	Yellow-fleshed	Late January	More suited to southern areas
Fillery	Yellow-fleshed freestone	February	All districts
Gold Mine	White-fleshed	February	All districts
Sunglo	Yellow-fleshed	February	All districts
Fantasia	Yellow-fleshed freestone	March	All districts
Royal Giant	Yellow-fleshed	March	All districts

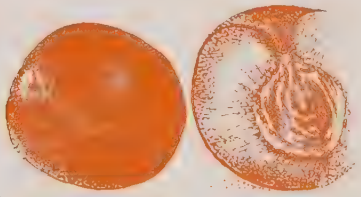
PRUNING Peach and nectarine



Fruit buds are fuller and rounder and easily distinguished from the thinner leaf buds

Pruning consists of the removal of laterals which have fruited and thinning out the new laterals which have grown. Shorten back the terminal growth to ensure the tree does not become too high.

Peaches ripen from mid-December through to early April.



Plum

Plums are tolerant of most soils including heavier clays, but prefer deep, well-drained soils. Sites must be frost free from early September onwards when the trees are in flower.

Plums require a small amount of winter chill to set fruit and do best in a dry spring followed by a mild summer. Plum varieties ripen from mid-December until the end of February.

Plums can be grown in a vase shape, on a central leader system, or as a fan trained against a wall. Pruning is best done in the same summer under dry conditions to avoid silverleaf infection.

Plums bear fruit on spurs which will

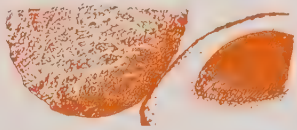
PLUMS			
Variety	Description	Pollinator	Ripens
Evans Early	Yellow flesh	Not required	December
Angelina Burdett	Yellow flesh with purple skin	Grand Duke, Green Gage or President	December
Cherry Plum	Yellow-fleshed	Not required	December
Wilsons Early	Yellow-fleshed, red skin	Doris, Duffs Early Jewel	December
Duffs Early Jewel	Yellow-fleshed, red skin	Not required	December
Billington	Red-fleshed	Black Doris, Mariposa or Wilsons Early	Late December
Santa Rosa	Yellow-fleshed, red skin	Not required	January
Green Gage	Yellow-fleshed, green skin	Angelina Burdett, Coe's Golden Drop or Grand Duke	February
Monarch	Yellow-fleshed, purple/red skin	Not required	February
Coe's Golden Drop	Yellow-fleshed, red skin	Green Gage and President	February
Burbank	Yellow-fleshed reddish-yellow skin	Duffs Early Jewel	Late January
Sultan	Large, red-fleshed, red skin	Doris, Duffs Early Jewel or George Wilson	Late January
Satsuma	Red-fleshed, green speckled skin	Not required	Late January
Purple King	Yellow-fleshed, purple skin	Doris, Sultan Duffs Early Jewel	Late January
President	Large-fruited yellow-fleshed, purple skin	Angelina Burdett, Coe's Golden Drop and Grand Duke	February/March
Doris	Yellow-fleshed, red skin	Duffs Early Jewel, Santa Rosa	Early February
Black Doris	Dark red flesh and black skin	Duffs Early Jewel, Wilsons Early or Sultans	February
George Wilson (Omega)	Red skinned, red flesh	Duffs Early Jewel and Santa Rosa	Late February

remain fruitful for some years. Shortening of young strong growth immediately after harvest keeps trees under control. Remove tangled and unwanted growth.

The stonefruit spray programme can be used as a guide against most common pests and diseases.

SUBTROPICAL FRUITS

IN RECENT years there has been an increasing interest in subtropical fruits especially in the warmer parts of northern New Zealand. It is essential for most of these fruits to have a warm frost-free site sheltered from the wind. They also require a good deep free-draining soil.



Avocado

These handsome evergreen trees grow to a height of 9 metres and require a very light, free-draining soil, as they are extremely susceptible to collar rot in clay soils.

The main varieties are:

Hass: produces medium sized fruit with a pebbly thick skin which ripens from November to March.

Zutano: produces consistent crops of medium sized fruit with a green skin and a large stone. Zutano ripens from June to August.

Fuerte: medium sized pear-shaped fruit which ripen from August to November.

Hayes: similar to Hass but the fruit are larger in size and ripen from October to January.

Hopkins: large dark green fruit of good quality which ripens from March to May.

Reed: a late flowering variety with shiny green fruit which ripen from February to June.

Avocados grow naturally into a well shaped tree and little or no pruning is required. Trees grown from seed only rarely fruit and a grafted sapling must be bought from a nursery.

Avocados normally flower prolifically and a very small percentage of fruit set can still result in a good crop. Some avocados have a tendency to bear well every second year.

Fruit does not ripen well on the tree and fruit should be picked when fully formed and then ripened indoors. Fruit which is picked early will shrivel rather than soften before becoming ripe.

The major pests are leafroller caterpillars, scale, mealy bugs, thrips, bronze beetle, and can be controlled with Orthene or Target.



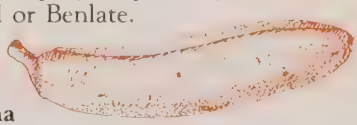
Babaco

A relative of the pawpaw, these trees require a sheltered frost-free site in full sun. They must be grown in a deep free-draining soil and be given adequate fertiliser, especially phosphate. An application of 250g per plant of Gro-Plus General Garden fertiliser should be made in September, December and March.

Growth is rapid from spring until autumn. After March one shoot should be allowed to develop to replace the main stem after it has rooted. Flowering begins on new wood in late spring. Fruit development takes place over about ten months with fruit reaching maximum size around November and turning yellow when ripe from December to February.

The major pests of babacos are mites, thrips and aphids, and can be controlled with Mite Killer or Orthene.

Plant in well-drained soils to avoid root rots and spray for powdery mildew with Saprol or Benlate.



Banana

Bananas are ornamental as well as being fruitful. Although they are truly a tropical plant, many home gardeners in northern areas have success with them. They require plenty of sun, a free-draining soil and shelter from wind and require a lot of fertiliser. Apply at a rate of 300g per application in September, December and March. Water regularly throughout the summer.

Bananas can be grown from suckers in the spring and will produce fruit 15–18 months later. Remove suckers as they develop and strip off wind-shredded

leaves. Once the fruit is formed on a bunch, the remaining head of the flower should be removed so that all of the plant's energy goes into the fruit and not into the old flower. A banana bunch is ready for picking when fruits have lost their angular shape. Ripen by hanging the bunch upside down in a warm place. After fruit is plucked, cut down the old plant to encourage new suckers, as the old stem will not fruit again.

Bananas in New Zealand are free of pests and diseases.



Casana

This fruit is a near relative of the tamarillo. The plant can reach a height of 4 metres. The clear, bright yellow, egg-shaped fruits have their own distinctive flavour. They require a sheltered, frost-free site with a light, free-draining soil. They bear fruit on the current season's growth. All old wood and laterals that have fruited should be cut back after harvest.

The major pests and diseases are aphids, green vegetable bugs, caterpillars, whitefly, leafroller caterpillar, thrips and bronze beetle and can be controlled with Orthene or Target. Powdery mildew and leaf spots can be prevented with Saprol or Benlate. Nematodes can also be a problem.

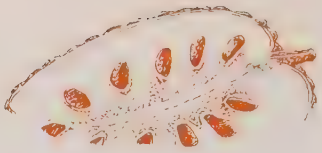


Casimira

A yellowish green fruit about the size of a small orange. The white or yellowish flesh has a flavour similar to peaches and apricots. Common varieties are Fernie, which is well flavoured but tends to bear biennially; Luke, which has large fruit but poorer flavour; and Wilson, producing quality fruit and heavy crops.

Casimiras need frost-free sites and a well-drained, light, sandy soil with plenty of additional fertiliser in spring and summer.

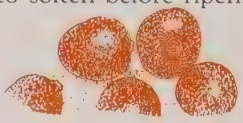
When the tree is about a metre high, remove the terminal buds to encourage branching. Casimiras ripen in autumn. The skin of mature fruit changes from a dull to bright green or yellow.



Cherimoya

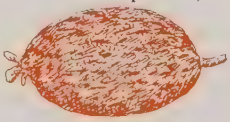
Sometimes known as the custard apple. The tree is semi-deciduous and grows to 6 metres. Large heartshaped green fruits are produced from August to November and sometimes weigh up to a kilogram. The skin is thin with a regular pattern of overlapping scales. The ripe flesh is white, juicy and creamy and best eaten raw.

The trees are suited to warm, humid districts with fertile, free-draining soils and need shelter from strong winds. Prune young trees to a vase shape over the first 3–4 years. Pruning should be done after fruiting, which will normally commence two to three years after planting. Pick fruit when skin turns a greenish cream colour. They may take several days to soften before ripening.



Cranberry

The cranberry is a small evergreen shrub with small leaves which often turn red. The fruit are round and red, about 10mm in diameter. They have a sharp flavour and are normally eaten raw or used in pies or jellies. They have a neat growth habit and are commonly used as hedges. They tolerate moderate frosts and grow best in a free-draining, moist soil. Major pests are leafroller caterpillars, thrips and birds.



Feijoa

Feijoas are one of the hardiest of the subtropicals, growing in most soils and tolerating several degrees of frost. They prefer a free-draining soil and shelter for best results. The bushes reach a height of three metres and require minimal pruning.

Feijoas are commonly available as seedlings, but plants grown from cuttings or grafted specimens are more reliable. While single plants will crop, having more than one improves pollination. Feijoas flower in their first year or two

but will not set fruit until the wood matures in the third or fourth year. The fruit is produced on the base of the current season's growth.

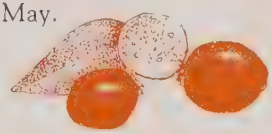
Removal of selected branches in mature trees is important to maintain an open habit. The fruit ripens between April and June and when mature they will fall off the tree at a touch. Most home gardeners prefer to harvest by gathering fallen fruit daily. The fruit are best left for two to three days before eating.

One to two kilograms of Gro-Plus Citrus and Fruit Tree fertiliser per plant applied in two applications in October and February will greatly help. Watering through the dry summer period will ensure good sized fruit. Major pests are leafroller caterpillar and scale, which are controlled with Orthene mixed with Conqueror oil.



Fig

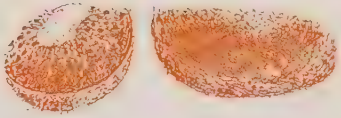
Figs require a sunny sheltered spot and thrive on abundant moisture. They do particularly well in the milder climates of New Zealand where they develop into a large fruiting tree. They require minimal pruning and only moderate fertiliser applications. Figs are relatively free of pests and diseases, but birds are often a problem. Netting the tree for protection is often required when fruit ripens in March to May.



Guava

The most common guava in New Zealand is the hardy strawberry guava of which there are both red and yellow varieties. Guavas require a warm aspect free from frosts. Soil and fertiliser requirements are the same as for feijoa and they require minimal pruning and training. They need regular fertiliser application and watering through the summer period.

The major pest problem is thrips which causes a silvering of the leaves and a hard rough fruit. They are controlled by spraying with Orthene or Target from December to April.



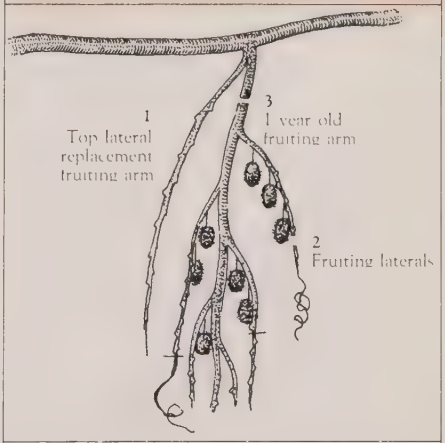
Kiwifruit

Formerly known as the Chinese Gooseberry, this deciduous vine crop can be grown in most northern and coastal areas. The dormant plant is tolerant of moderate frost but the young growth and fruit are harmed by late and early frosts and wind.

Male and female flowers are borne on separate plants and therefore it is necessary to buy both a male and female plant, unless both have been grafted onto one plant. Kiwifruit bears fruit on new current season's growth.

The vine is vigorous and can be grown from a T-bar fence, a pergola, or as an espalier. It is important not to let the more vigorous male plant dominate the area, as it is the female that carries the crop. The female plant requires summer pruning which aims at stopping growth of the fruiting laterals two leaves past the last fruit set. This also encourages new laterals to emerge from the main leader which will carry next year's crop. The male plant is pruned heavily once a year after flowering. Winter pruning of females aims at removing all of the wood which

KIWIFRUIT PRUNING



When pruning ensure replacement of fruiting arms
1 *LEAVE next season's fruiting arm unpruned*
2 *CUT BACK fruiting laterals in summer*
3 *IN WINTER remove all old fruiting arms*

has carried fruit and tying down the new laterals which have grown during the current season.

Pollination is sometimes a problem as the flowers are unattractive to bees. In home garden situations hand pollination may be worthwhile in order to get large fruit.

Kiwifruit require a deep free-draining soil and must be sheltered from cold winds. They must be watered regularly during December, January and February while the fruit is sizing. They commence fruiting in the third or fourth year.

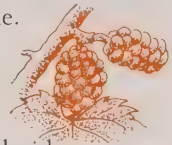
Major pests are leafroller caterpillar and scale which can be controlled with Target or Orthene. The major fungous disease is botrytis at harvest time, which can be controlled with Benlate.



Loquat

Loquats can be grown in most parts of New Zealand but will only bear fruit in the warmer, milder areas. They prefer a sunny, sheltered spot protected from wind, and will tolerate a wide range of soil types but prefer acid conditions. They require little or no pruning. The fruit ripens from October to December.

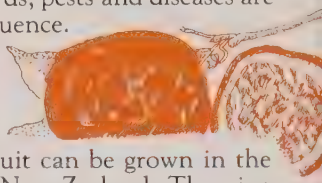
The major diseases are fire blight and black spot. The latter can be controlled with Copper oxychloride.



Mulberry

Mulberries are hardy, deciduous trees which can be grown in most parts of New Zealand. They tolerate a wide range of soil types but will benefit from watering in dry spells. Pruning is not necessary as they naturally grow into large spreading trees. They can be trained into a standard tree to espalier form if desired. The fruit ripens in late summer and will drop to the ground when fully ripe.

Except for birds, pests and diseases are of little consequence.



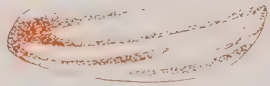
Passionfruit

This popular fruit can be grown in the warm parts of New Zealand. The vine grows vigorously and is useful for covering pergolas, trellises and old tree stumps. Passionfruit does best in sunny, frost-free sites well protected from wind. It is essential that they have light, free-draining soils as they are susceptible to many root rot diseases. They benefit from an application of Gro-Plus Citrus and Fruit Tree fertiliser twice a year.

Early training aims at establishing a framework of leaders from which laterals will grow and bear fruit. The fruit is carried on the current season's growth. Pruning back is needed to prevent vines becoming a tangled mass. This is done in October or November by removing dead, diseased or spindly wood and cutting back old laterals to within two buds of the leader.

Passionfruit are ripe when the skin turns purple and fruit falls to the ground. They require watering in a dry summer to prevent fruit drop and premature wrinkling of fruit.

Passionfruit vines tend to have a relatively short life of only three to five years. Root diseases can only be remedied by ensuring they are planted in a well drained light soil. The following spray programme can be used as a guide to controlling the major pests and diseases.



Pepino

Another relatively new fruit which has

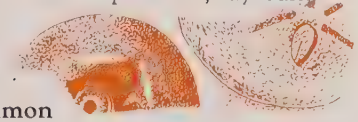
PASSIONFRUIT SPRAY PROGRAMME		
Time	Material	Pest/Disease
November to Feb at monthly intervals	Copper Oxychloride + Orthene®	Brown spot, mealy bug, Passion vine hopper
Winter at monthly intervals	Copper Oxychloride	Grease spot

become popular in New Zealand, the pepino forms a small shrub approximately one metre high and has 10–15cm long yellow and purple streaked fruit resembling a tamarillo in shape. The flesh is pale yellow, solid and juicy. The taste is similar to that of rock melon.

Pepinos require a warm, sheltered spot with a free-draining, fertile soil. They will withstand a light frost once established. Pepinos can be raised from seed, but it is more reliable to obtain plants which have been propagated from proven material. They usually form bushes without training. Feed with Gro-Plus Citrus and Fruit Tree fertiliser during spring and summer together and water well.

The major pests of pepinos are mites, which are controlled with Mite Killer; whiteflies and caterpillars which are best controlled with Target. Major diseases are blight and sclerotinia fruit rot and these can be controlled with Bravo.

If snails are a problem, lay bait.



Persimmon

Persimmons were introduced to New Zealand many years ago, but only in recent times have they become fashionable. The attractive spreading tree grows to about 5 metres in height and the brilliant autumn foliage is particularly ornamental. Astringent persimmons, which must be kept until very soft and over-ripe before they can be eaten, will produce good crops in most districts of New Zealand. The non-astringent varieties have a higher temperature requirement in the growing season and while they can be grown in cooler areas of New Zealand they are likely to produce astringent fruit.

Persimmons will tolerate most soil types but shelter from wind is essential. The self fertile varieties are most suitable for home gardens.

Tanenashi: A reliable astringent variety which bears large fruit.

Fuyu: The most widely grown non astringent variety, Fuyu bears large rounded fruit which mature in May.

Jiro: A non-astringent variety similar to Fuyu which matures a little earlier.

Little pruning of the adult tree is needed, but it is important to develop a system of strong branches in the early years as the brittle wood breaks easily. A trellis system to support branches may be required.

The major pests of persimmons are leafroller caterpillars, mealy bugs, thrips and lemon tree borers which can be controlled with Orthene or Target. The major diseases are botrytis which are controlled with Benlate or bacterial blast which is controlled with Copper oxychloride.



Tamarillo

Formerly known as the tree tomato, tamarillos are a shrub-like tree growing to 3 metres. The brittle wood is easily broken under the load of a crop unless they are sheltered from winds. They prefer a light, well-drained fertile soil in a frost-free area.

Tamarillos can be raised from seed, but

TAMARILLO PRUNING



To prune Tamarillos, cut back laterals to promote strong new growth from lower in tree

NUTS

Nuts have become increasingly popular in recent years because of their high food value and good keeping qualities. The eventual height and spread of a nut tree, however, should be considered before planting. Most grow to a very large size, although hazelnuts, almonds, and macadamias are smaller. Nuts should be harvested daily as they fall to the ground and spread out on trays to dry before storage. For long-term storage, the nuts should remain in their shells.

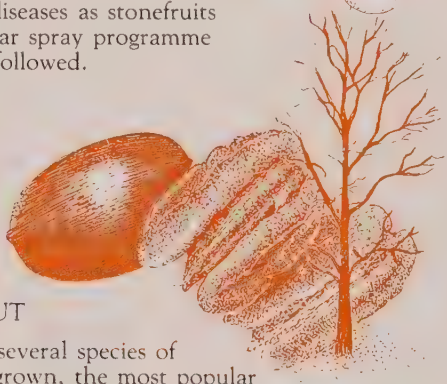
ALMOND

Almonds are relatively easy to grow throughout most of New Zealand, but not in the warmer areas as winter chilling is required. They are a deciduous tree growing to six metres high and begin to bear in two to three years. Another pollinating plant is often required. An annual maintenance dressing of Gro-Plus Citrus or Fruit Tree fertiliser is necessary. Almonds are subject to the same pests and diseases as stonefruits and a similar spray programme should be followed.



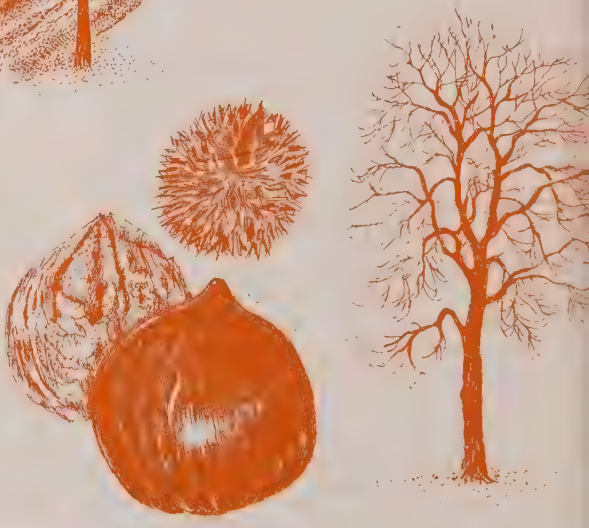
PECAN NUT

Pecans are popular because they are rich in flavour and lack bitterness. They belong to the same family as the walnut and form large deciduous trees. Grafted trees will start bearing in three to four years. A pollinator is required for best results.



CHESTNUT

There are several species of chestnuts grown, the most popular in New Zealand being the Spanish Chestnut which is a large attractive deciduous tree. Trees begin to bear nuts aftr four to five years and reach their maturity in 15 to 20 years. Always ensure that a grafted or budded tree is planted as they do not grow true to type from seed. Pruning is not necessary with chestnuts as they form well shaped trees naturally. The ripe nuts fall to the ground in autumn. Gather frequently, particularly in wet weather, as they will soon rot if left.

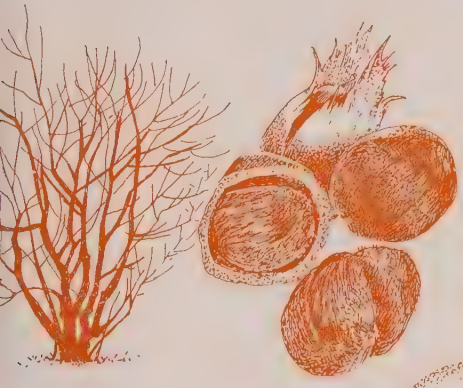


WALNUT

The Japanese walnut is the most common in the home garden, providing a heavy crop of small nuts. The English walnut is also suitable, but grows into a large tree.

Walnuts require full sun and a rainfall of less than 750mm per annum. It is important to consider the planting position carefully as walnut roots can cause other plants to lose thrift if they come in contact with them.





HAZELNUT

A plant relatively new to New Zealand, the tree grows in most parts of New Zealand, but prefers a cool climate. It usually bears fruit in five to seven years. Nuts ripen between February and March, as they fall to the ground. Gather to avoid discoloration or mould.



MACADAMIA

Considered one of the best edible nuts in the world, macadamias are eaten raw, roasted, salted or chocolate coated. Macadamia is a member of the Protea family and resembles the New Zealand Rewarewa or honeysuckle. Macadamias are a native of Queensland and prefer a tropical climate, growing to nine metres tall. They require plenty of moisture and warmth and do well in the northern parts of New Zealand. The most promising variety for New Zealand conditions is Beaumont. Grafted Macadamias will begin to bear in the fourth year onwards and should yield about 25 to 30kg by about the fifteenth year.

Macadamias tend to develop an upright habit if left untrained. This can cause the tree to split and break at a later stage and trees should be trained to a single leader with laterals about half a metre apart. Nuts fall from the tree when ripe in late autumn and should be gathered daily. Nuts should be removed from the husk within 24 hours or they become extremely hard and difficult to remove. The fresh nuts should be dried on racks before putting into storage.

Fertilise with Gro-Plus Citrus fertiliser at the rate of 200g per year of the tree's age. Extra nitrogen may be beneficial, but an excess of phosphate can prove harmful.

cuttings are easy too. In recent years selected varieties have been bred which are preferred. Aotea Round and Red Delight are two red varieties which do well. Kaitaia Yellow and Amberly Gold are two yellow-skinned, yellow-fleshed varieties which are sweeter and not so strong in flavour. Gold Mine is particularly suitable for the home garden. It has a reddish skin, sweet yellow flesh and is a heavy cropper producing fruit from May to October depending on pruning time.

Pinch out the centre of young plants at about half a metre high to encourage branching. This is particularly important with plants grown from seed. Tamarillos produce fruit on the current season's growth and begin to bear in their second year. Pruning aims at cutting back all laterals which have fruited to promote strong new growth from lower in the tree. Pruning is normally carried out in early spring which encourages early cropping.

A maintenance fertiliser application of Gro-Plus Citrus fertiliser during spring and summer is required together with watering in a dry season.

The major pests of tamarillos are aphids, green beetle bugs, looper caterpillars, whiteflies, leafrollers, thrips and bronze beetles, all of which are controlled with Orthene. The major disease is powdery mildew which is best controlled with Saprol or Benlate. Other diseases are tomato canker, bacterial blast, tamarillo leaf spot and virus diseases.



CHAPTER SEVENTEEN

CONTAINER GARDENING

INDOORS AND OUTDOORS

GROWING PLANTS in containers whether outside or in the home creates a new range of opportunities for enjoying plants and enhancing our surroundings. Perhaps the greatest change in gardening in recent years has been the evolution of the patio, deck and pergola, for which plants in tubs, pots, barrels, boxes, hanging baskets and containers of varying types are ideal. Flats and other high density apartments can also be brightened up with containers and window boxes, which provide further gardening opportunities.

GROWING IN containers allows more flexibility with the range of plants that can be enjoyed. New arrangements of foliage and flowers are always possible and according to prevailing temperatures, plants can be moved to shelter or sunshine when required. Putting container plants in protected conditions can allow tender plants to be grown in difficult climates.

Container gardening is easy, creative and very rewarding.

Containers are available in a range of sizes, styles and different materials. Remember that plastics and untreated timbers have a limited life outdoors when exposed to sunlight, and the most permanent materials for outdoors are concrete, baked clay, ceramic and treated timber.

Containers require drainage holes to avoid waterlogging plants. Indoors and in some outdoor situations a saucer is needed to protect surfaces from water damage and to stop roots growing down through the bottom of the pot.

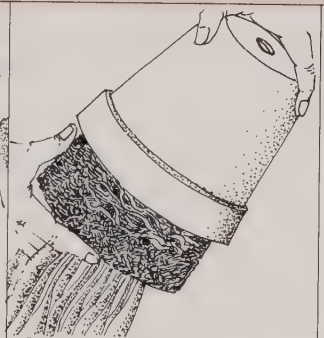
THE GROWING MEDIUM

PROBABLY THE most important aspect of growing in containers is the choice of growing medium or potting mix. A good mix should be free-draining, with sufficient air space to allow plant roots to breathe, but at the same time hold ample water for the plants. Most garden soils are unsuitable as they tend to compact easily, impeding drainage and cutting off air to the roots which results in root rots. Good potting mixes contain peat and pumice and/or graded bark. For long-term tree and shrub plantings in containers, up to one quarter of the mix can be a good garden soil.

REPOTTING



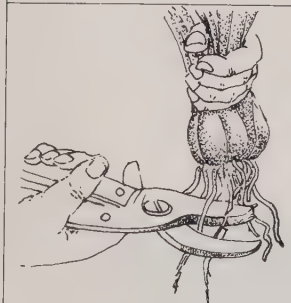
1 *WATER thoroughly*



2 *INVERT POT and remove plant.*



3 *REMOVE old potting soil. Tease out roots*



4 *CUT OFF damaged roots*



5 *REPOT into slightly larger pot with fresh potting mix*



6 *FIRM SOIL and water*

FERTILISER

POTTING MIXES purchased from garden centres have sufficient nutrients for approximately three months, and extra feeding will be necessary afterwards. Peat, pumice or bark have very little natural reserve of nutrients and it is necessary to use a well balanced fertiliser.

Soluble fertilisers can be applied each time the plant is watered supplying a little nutrient as the plant needs it, e.g. Lush. Alternatively, slow release fertilisers can be applied to the surface once or twice a year or can be added when repotting, e.g. Yates Indoor Plant Feeders.

POTTING

FOR ANNUALS, perennials, bulbs and similar plants, containers should be at least 15cm deep. For larger specimens, choose a container that has a wide base and is heavy enough not to blow over in the wind. It is preferable to pot plants on gradually through a range of sizes rather than put a small plant into a large container. Shift plants to larger containers when they become pot bound, which is obvious when the roots protrude from the drainage holes.

Water thoroughly before repotting. Invert and tap the edge of the pot firmly to remove. Tease out the old roots and remove the old potting mix from the root ball, gently untangling the roots. Cut off any damaged roots and repot into a slightly larger pot with fresh potting mix. Firm the mix around the root ball, but do not ram or over compact. Do not bury the plant any deeper than it was before, and water thoroughly.

WATERING

WATERING IS an important aspect of growing plants in containers. It is important to water regularly in dry weather, as plants may dry out very quickly.

Size of the plant, type of plant, size of the pot or container and the time of year will affect the amount of water required. A very large plant in a relatively small container on a hot summer's day will dry out rapidly and will probably require watering at least once or possibly twice a day. A small plant in a relatively large pot in cool cloudy weather may require watering once a week. Water when the potting mix feels dry to the touch.

Watering can be done simply by hand with a watering can or with a Plassay automated watering system where individual containers can be watered with drippers (see Chapter Two).

OUTDOOR CONTAINER PLANTS

THE FOLLOWING make ideal container plants for outdoors.

Annuals

Annual flowers make a colourful display in pots or hanging baskets. They need a sunny position sheltered from the wind. Dwarf or compact varieties give best results.

Spring Flowering (sow in autumn or early spring): ageratum, alyssum, dwarf snapdragon, dianthus, Livingstone daisy, lobelia, marigold, dwarf phlox, bijou sweet pea, sweet william.

Summer Flowering (sow in spring): Marigold (dwarf), petunia, portulaca, salvia (dwarf), zinnia (dwarf), aster (dwarf).

Autumn/winter flowering (sow in summer): calendula, cineraria (dwarf), nemesia, pansy, polyanthus, primula, viola.

Bulbs

Many bulbs make ideal container specimens and are the easiest of plants to grow in pots. Their only disadvantage is that many have a limited period of flowering.

Spring flowering: anemone, ranunculus, freesia, daffodil, crocus, hyacinth, lachenalia, jonquil, trytonia, tulip, lilium.

Summer flowering: calla, dwarf dahlia, tuberous begonia.

Autumn flowering: nerine.

For details of bulb culture refer to Chapter Ten on Bulbs.

Fruits
Many dwarf or semi-dwarf fruits are suitable for planting in containers.
Citrus: mandarin and tangelos are especially suitable because of their compact growth.
Apples: dwarf varieties only.
Peaches and nectarines: dwarf varieties.
Berry crops: strawberries, gooseberries and currants.



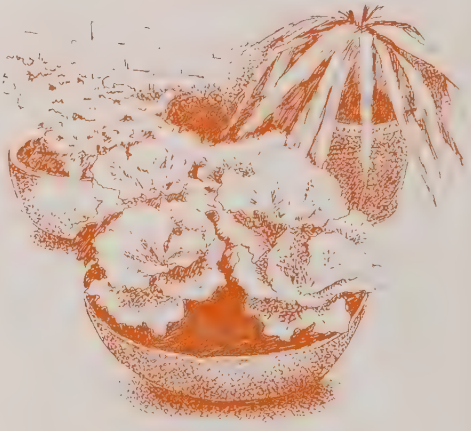
Trees and Shrubs
There are many trees and shrubs suitable for growing in containers. Fast-growing trees and shrubs should be avoided as they quickly outgrow the container and deteriorate rapidly. Watering is very important with large plants as they can use up all the water in the container in a day or less. It is important to water daily. An automatic watering system will make this task more accurate and less time-consuming. Choosing plants that will tolerate drying out occasionally, is also advisable.

When grown in containers plants will not normally reach their full potential because of the restricted root zone. Some of the better species for containers are:
Trees preferring shade: holly, magnolia, rhodendron.
Other trees: maple, ash, gingko, liquid amber, rhus, melia, gleditzia, kauri, norfolk pine, kowhai, pohutukawa.
Shrubs preferring shade: aucuba, azalea, camellia, daphne, fuchsia, hydrangea, pieris, rhododendron.
Other shrubs: brassica, griselinia, cabbage tree, cedar, manuka, pittosporum, pseudopanax, snowball tree.



Vegetables
Most vegetables can be grown very successfully in containers. Concentrate on quick-maturing, compact or dwarf varieties and plant them close together. Suitable varieties are: beetroot, cabbage (Golden Acre), cauliflower (Yates Mini), cucumber (Pot Luck), lettuce, melons, parsley, pepper, radish, silverbeet, spinach, tomato (Patio, Red Alert, Sweet 100), dwarf beans and herbs.

Potatoes can be successfully grown in a deep barrel or drum. Plant a vigorous variety such as Ilam Hardy in the bottom, covered with 10–15cm of mix. When the tops have emerged 25cm, cover half this with more mix. Repeat until the container is full. Take care not to compact and do not over-water.



HOUSE PLANTS

GROWING AND displaying house plants has been popular for many generations. The land area around houses today tends to be smaller and the garden is moving indoors in the form of house plants, which decorate homes, office buildings and hotels. Some people enjoy the challenge of growing the more delicate and difficult types of plant indoors.

Choosing indoor plants

House plants are those which give a permanent display throughout the year. Many are attractive because of their foliage colour and form, whilst others are grown for their flowers. Give thought to their growing conditions: for example, the amount of light and type of heating in the room. Foliage plants will suit tables and troughs, while climbers or taller plants are suitable for room dividers.

Using plants indoors

Plant choices are largely a matter of personal taste, but make sure you choose plants which suit the conditions. Natural lighting, warmth and humidity vary between different buildings and rooms. Scale and proportion also play an important part. Use smaller plants in small rooms, where one or two may be used to soften a corner. Generally, use large plants in spacious areas.

Consider the colour scheme and type of furnishings when choosing plants for a given position. A dark background will set off a delicate tracery of pale green ferns or the sharply defined outline of a Sansevieriea. Light-coloured walls benefit plants by reflecting light and suit variegated, highly coloured and flowering plants. Concealed lights add further emphasis at night to sculptured plants such as palms.

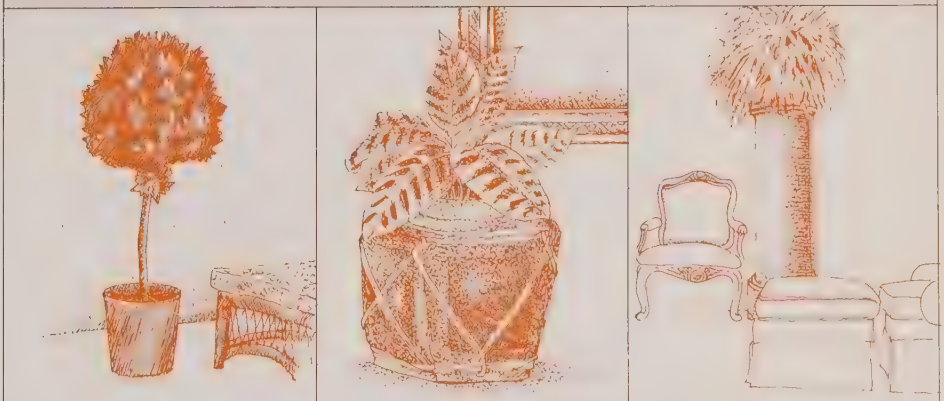
Culture

Place plants in the lightest position out of direct sunshine. Fluorescent lighting may be provided to supplement natural light. Avoid fluctuations of temperature; aim to provide a continuous day temperature of 15–20°C with a minimum night temperature of 7°C. Plants prefer moderate to high humidity; to lessen the dehydrating effect of a dry atmosphere, place potted plants in trays with layers of pebbles and keep the water level to the tops of pebbles.

Care of house plants

While more indoor plants are killed by over watering than any other factor, plant failure is usually associated with lack of light and sometimes cold draughty conditions. There is no simple rule on how often to water, as requirements vary according to plant species, size of plant,

INDOOR PLANT FORMS



Tall and large for spacious areas

Small and compact for small-scale surfaces

Weeping for high positions

its position in the house, the size of the pot and the time of the year. To determine if a plant needs watering, feel the soil surface regularly and water it as it dries out.

In general, plants in warm, sunny rooms during summer may require water every day, while they will need water only once a week in winter. Plants in cool, badly lit areas may need watering every third day in summer and once a week or less in winter.

Many house plants become tired in appearance from lack of feeding. A multitude of plant foods are available: powdered fertilisers dissolved in water are the most economical while liquid foods are more convenient. Always ensure you are using a balanced fertiliser, e.g. Lush.

Pests and diseases

Houseplants, while susceptible to a few insect pests and diseases, are most likely to suffer from difficult growing condi-

HOUSEPLANT AILMENTS	
Problem	Plant response
Aphids	New leaves curl and become distorted. Presence of small, soft insects on buds, young stems and leaves. To control, spray with Orthene®
Mealy Bug	White cottony or waxy insect on the underside of leaves and leaf axils. Infested plants become unthrifty. Control is difficult. If only a few present, wipe off with a damp cloth. Otherwise spray with Orthene® Severely infested plants should be discarded.
Scale Insects	Stems and leaves become covered with flattened reddish, grey or brown scaly bumps. To control spray with Orthene® Repeat applications may be necessary.
Mites	Leaves yellow, become stippled, and may fall. There may also be spider-webbing present. To control, spray with Mite Killer at regular intervals.
Botrytis	Brown spots and blotches appear on leaves and sometimes stems. Under humid conditions infected portions may be covered with a fuzzy grey growth. Diseased and dead plant material should be removed promptly, particularly flowers. Avoid splashing water on foliage and growing plants in crowded conditions where the air is damp and still. Spray with Benlate.®
Too Little Light	Leaves smaller and paler than normal. Flowers poor or absent. Lower leaves turn yellow, dry and fall. Spindly growth with long spaces between leaves. Variegated leaves turn green.
Too Much Water	Leaves limp. Soft areas may appear. Poor growth. Leaves curl. Leaves yellow and wilt, tips may brown.
Too Cold	Leaves curl, brown and fall.
Too Hot	Spindly growth when in good light conditions. Flowers short-lived. Lower leaves wilt, brown and fall.
Sudden Change in Temperature	Leaves fall after rapid yellowing.
Too Little Humidity	Leaf-tips brown and shrivelled. Leaf edges yellow. Buds and flowers shrivel and fall.
Draughts	Leaves turn yellow and fall. Leaves curl and fall. Brown tips or edges on leaves.

tions. Use the chart as a trouble shooting guide.

Grooming

House plants need regular trimming and cleaning to keep a balanced shape. Good grooming also reduces the possibility of disease.

Plant foliage benefits from an occasional cleaning to remove dust and other particles, allowing a maximum of light to reach the plant. It also helps to remove insects and insect eggs. Wash large-leafed plants with a damp cloth using a mild solution of dishwashing soap and water to make the job easier. Shine hard-surfaced leaves with a light oil, e.g. Conqueror Oil. On warm, drizzly days, place house plants outside for several hours to freshen up.

The easiest plants to grow indoors are those with glossy leaves: philodendron, rubber plant (ficus), prayer plant (maranta), mother-in-law's tongue (sansevieriea) and dieffenbachia.

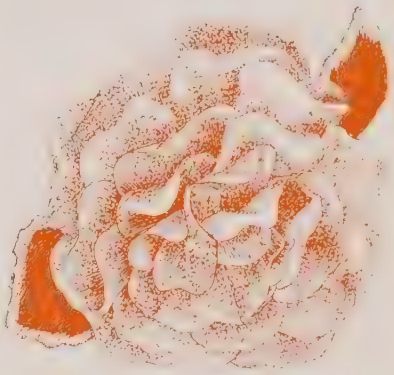
The flowering indoor plants are not as hardy as the foliage plants and also require more light.

POPULAR HOUSE PLANTS



African Violets

A particularly common and favourite flowering house plant. No other plant equals its ability to flower indoors for months on end. Its compact size makes it perfect for windowsill, table-top arrangements and hanging displays. There are thousands of named african violets to choose from. The plain, green-leafed varieties are easier to grow than the fancier types. Generally they require plenty of bright, indirect light, particularly in winter. If the plant receives less than 12 hours of good light a day, it is likely to stop flowering. Evenly moist soil, warm temperatures, high air humidity and regular feeding are other important factors for good growth. African violets like being slightly pot bound. Leaf cuttings can be taken in spring. Remove all dead leaves and flowers promptly. Shape the plant by removing side shoots.



Begonia

Begonias are commonly grown as house plants. There are over 1500 known species and they offer a vast array of different foliage shapes and colours as well as flowers.

Begonias are easy to keep healthy and blooming. They respond to bright light and average indoor temperatures that drop slightly at night. They should be given fertiliser every two to three weeks to keep constant blooms. They are sensitive to over watering and should be watered when the soil is dry to touch. Begonias can be easily propagated from stem and leaf cuttings or division. Plants will flower better when pot-bound, so only repot when growth is inhibited. Pinch back young plants to give bushiness and strengthen the flowers.



Bromeliads

Bromeliads have exotic foliage and showy flowers. Their most distinctive feature is the rosette of leaves that mould into a cup to hold water that nourishes the plant. From the centre the large, colourful flowers emerge. Originally from the jungle, most Bromeliads are epiphytes and are used to growing suspended from trees and rocks, gathering moisture and food from rainfall and debris in the air.

In the home they can be placed in pots or hanging baskets. Pour water into the rosette cup, rather than onto the soil.

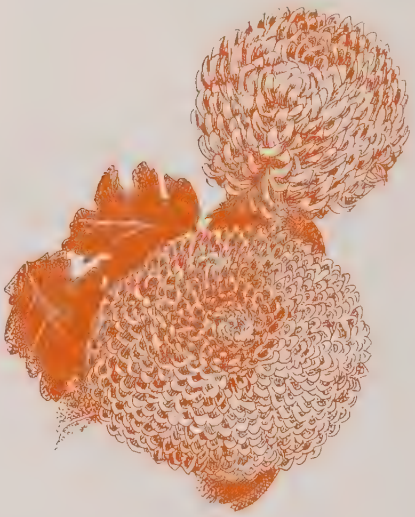
Average temperatures of 20°C are required for foliage-type Bromeliads but warmer temperatures are needed to initiate buds in flowering types.

Brown areas on leaves may be due to sunburn or dry air. Scale and mealy bug can also be problems and are controlled with Orthene.



Cacti

Cactus is the name of a large family of over 2000 plants, all succulents. Cacti are extremely tolerant plants. Although they enjoy dry soil, they should be watered occasionally and fed with liquid fertiliser over the summer. Place on a sunny window with warm daylight temperatures. Root or stem rots may develop under poor drainage conditions or poor air circulation. During winter keep cool and dry to encourage flowering.



Chrysanthemum morifolium

These plants are chrysanthemum hybrids and are considered to be house plants because they are often purchased to display in the home while flowering. They can be transplanted in the garden but may be difficult to grow outdoors. Commercial growers apply dwarfing chemicals and place the plants in the dark, giving them short days and long nights in order to induce them to flower by a certain date.

Avoid buying large leafy plants that have no buds: instead look for plants with a few open flowers and plenty of buds. Place the plant in a cool room on a windowsill where it should bloom for six to eight weeks. To save the plant, prune it back after flowering and reduce watering, then plant in your garden. Pinch back often to maintain a full, bushy plant. They can be propagated by taking stem-tip cuttings of new shoots in spring. The leaves will wilt readily if the

soil dries out and high temperatures will cause the flowers to develop rapidly and die quickly. Buds that fail to open may not have received enough light.



Coleus

The richly coloured leaves and wide variety of forms of this plant make coleus a very colourful, inexpensive and easy-care house plant. It is fast-growing with velvety leaves in a multitude of colours, some with fringed margins. Water and liquid-fertilise regularly. Nip flowers when they appear, to encourage compact growth and branching. They can be grown from stem cuttings in the spring and summer very easily, or grown from seed in the spring. Some leaf drop in winter is normal. Leggy stems result from insufficient light and lack of pinching.

Cyclamen

Cyclamen are one of the most popular plants for winter and early spring flowering. They can be grown outdoors in a shaded position, but are generally grown indoors in pots. The foliage of some varieites is as decorative as the flowers and enhances their ornamental value, particularly if they are in leaf for nine months of the year.

Garden cyclamen can flower for years on end; however, when grown indoors in pots the flowering time is extended by such a long period that much of the vigour of the plant can be drained away. Flowering from old bulbs can be disappointing and fresh new plants give better results. However, with care it is possible to retain old bulbs and keep them growing and flowering over a number of years.

Cyclamen like to be kept cool. They thrive when night temperatures are near 10°C and the atmosphere is humid. Soil should be moist but not wet. A well-lit position will keep the plants neat and compacted. Under low light conditions, stems and flowers become long and thin. Under direct sunlight leaves may be burnt. Keep away from dry air and draughts. Feed with Lush weekly to keep plants fresh.

Old bulbs should be repotted in summer. Following flowering in winter and early spring the plants rest for a few weeks and the foliage turns yellow and dies down. Pots and containers are best placed outdoors in a shady position.



After six to eight weeks new leaves will start to appear on the top of the bulb. At this stage they can be repotted and watering resumed. Keep the bulb on the surface of the potting mix, the roots grow from the bottom and the leaves and flowers appear from the flat or slightly concave upper surface.

Seed can be sown from late summer to early autumn. The flower bulbs will not develop until the following autumn.



Ferns

The delicate composition of fern fronds gives a graceful, peaceful atmosphere to a room. Ferns come in a multitude of shapes and sizes. Their natural home on the forest floor is in dappled sunlight, so avoid exposing them to direct sun and try and match as nearly as possible their natural growing environment. The air as well as the soil must always be kept moist. Most ferns grow well in a room with average temperatures during the day with a drop at night.

Remove old or discoloured fronds which develop. Loosen topsoil so air can circulate.

Orchids

Orchids are ideal plants for pots and tubs and can easily be moved to a favoured position for flowering.

Orchids belong to one of the largest plant families, with more than twenty-thousand species and many thousands of varieties. Although they are often thought of as being exotic and difficult to grow, some orchids are very adaptable and easily grown by the home gardener.

Cymbidiums are the most popular orchids in the home garden. In mild climates where the temperature does not drop below 5°C they provide a wonderful long-lasting winter flower.

Cultural techniques for orchids have tended to follow traditional lines and have been based very much upon an 'art' approach. However, Cymbidium orchids have now become an important crop in New Zealand, both as cut flowers and flowering pot plants. As a result, a number of research trials have been carried out by the Ministry of Agriculture and Fisheries, in an attempt to standardise the ideal growing conditions for orchids.

From these trials a number of important factors have become evident. To keep orchids growing actively over the winter and less susceptible to disease, the minimum temperature should not drop below 10°C. This is the most significant factor in improving their growth.

Fine grade peat and bark growing mix and frequent watering and feeding also improve growth and flowering. A fine mix retains more moisture and more nutrients and therefore promotes more growth. A coarse mix, as used traditionally, has very little moisture or nutrient retention and results in relatively slow growth rates, but may be preferable in cooler growing conditions.



Orchids need slight shade in summer but full sun in winter. The number of flower spikes an orchid plant will produce is determined in spring and is influenced by day and night-time temperature fluctuation and high light intensity over this period. High potassium levels and a reduction in the levels of nitrogen applied over spring and summer also contribute to spike initiation and flower development.

Cymbidiums are best fed regularly, ideally at each watering. On young orchids (which are yet to flower) and on mature orchids which have finished flowering use Orchid Food for Growing Plants. This has a high nitrogen content which promotes vigorous vegetative growth and recovery after flowering.

Over the summer and up until the last flowering spike has been picked, feed with Orchid Food for Flower Promotion. This fertiliser has a high potassium content which helps initiate the spikes and improves the quality of flowers.

To learn more about the culture of orchids you may consider joining an Orchid Society of which there are many throughout New Zealand.

ORCHID PROBLEMS		
Symptom	Cause	Remedy
Pests		
Small insects clustered on new growth.	Aphids	Spray Orthene®
Whitish cotton-wool like tufts on leaves and pseudo bulbs	Mealy bug	Spray Orthene®
Yellow or brownish mottling of leaves	Mites/Thrips	Spray Mite Killer/ Orthene®
Young leaves or flower buds eaten off	Slugs and snails	Blitzem or Mesurol® pellets
Small brown flattened scales on leaves and pseudo bulbs	Scale	Spray Orthene®
Diseases		
Fungal rot in growing point. Leaf blackens at base	Phythopthora/Pythium	Avoid overhead watering, reduce humidity and improve ventilation. Spray Benlate.
Black spots	Glomerella	Avoid overhead watering, reduce humidity and improve ventilation. Spray Manzeb
Flowers deformed and semi-transparent patches on leaves	Virus	Burn plants
Physiological		
Brown speckling on young leaves and petals	Excessive humidity	Improve ventilation on warm days
Yellow brown leaves sometimes with brown drying patches	Scorching due to lack of shading and proper ventilation during hot spells	Shade in spring and ensure adequate ventilation
Flower buds fail to develop properly usually withering or falling early	Too cold or too hot and dry	Moderate the extremes in temperature
Small or poor yellow leaves with few or no flowers	Nutrient deficiency	Repot. Liquid-feed at each watering



Palms
Palms are a popular house plant. Their graceful, rich green foliage gives surroundings tropical flair and elegance. There is a large variety of plant forms. They are easy to care for, tolerant, and adapt well to limited light and controlled temperatures inside homes. During the spring and summer, water and liquid-fertilise plants regularly. Protect from direct sunlight.

HANGING GARDENS

A HANGING garden is a versatile and colourful way to bring the pleasure of gardening to those difficult and barren spots around the house or flat.

Hanging containers are available in a wide range of materials, styles, sizes and colours. They need the same quality potting mixtures as other containers, but they do need extra watering, as with air circulating around them they are exposed to more constant evaporation than plants on the ground.

A wide range of plants is suitable for growing in baskets. Trailing plants, annuals, ferns, succulents or flowering creepers are all good. Suitable annuals are: petunia, lobelia, gypsophila, nemesia, verbena. Other plants include abelia, Camellia sasanqua, fuchsia, hoya, lantana, pelargonium, rosemary (prostrate), Thunbergia, vinca.

CHAPTER EIGHTEEN

ORGANIC GARDENING

IN RECENT years there has been a renewed interest in 'organic gardening'. While these words might suggest something mysterious, they describe in fact some well-established gardening techniques such as composting, mulching and crop rotation, all of which are described in other chapters of this book.

ORGANIC GARDENING as a total technique uses only naturally occurring (organic) materials, and avoids the use of synthetic fertilisers and pesticides. The 'organic' concept aims for a coexistence with natural systems, in the understanding that all living creatures on earth exist in a finely balanced relationship, where natural cycles should not be disturbed.

The whole garden should be involved, not just a vegetable patch or an orchard. Growing a variety of plants is most important, and monoculture – the growing of one particular crop or plant – is discouraged. Nature's diversity must be imitated.

The gardener needs to build up a knowledge of crop rotations, crop residues, the production of composts, the value of nitrogen-fixing plants, green manure crops, the value of rock minerals, and pest control using biological methods. In addition, techniques of soil cultivation and weed control will need to be developed which are appropriate for the soil type and climate of the area in which the garden is located.

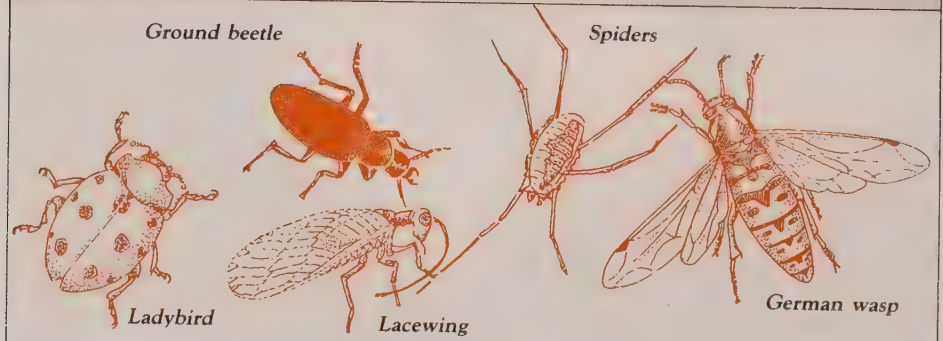
It is important to realise that there is no one method for the organic gardener. The best method for a particular area will only be developed by trial and error, which will mean some effort by the gardener to read, look and listen, in order to build wisdom and understanding of the location of the garden.

Organic gardening in its strictest sense is a philosophical lifestyle requiring commitment and dedication. There are three main organic or biodynamic organisations in New Zealand; the NZ Biological Producers Council Inc. (NZBPC), the Biodynamic Farming and Gardening Association and the Soil Association of NZ Inc.

While the basic principles of organic gardening are common sense and likely to be practised by all keen gardeners, opinions on the reliance, practicality and necessity of a total organic system differ greatly. There is certainly no scientific evidence to suggest that organically grown produce has any nutritive value different to conventionally grown food. Yields are generally lower, more physical effort is required and there is less of a focus on cosmetic perfection in produce.

In most home gardens, spraying is likely to become necessary at some stage. With common sense and a good gardening knowledge spraying can be kept to a minimum. When necessary and particularly when close to harvest, organic sprays can be chosen. Fortunately, modern technology is geared towards producing plants with a better pest and disease resistance, and natural and biological pesticides. For example, the following vegetable varieties are less suceptible to pest and diseases mentioned: Topweight carrot (carrot rust fly), Slicemaster cucumber (downy and powdery mildew), Pot Luck cucumber (sclerotinia), Sugar Baby water melon (powdery mildew), Dixie Jumbo rock melon (powdery and downy mildew, Early Money tomato (verticillium and fusarium).

BENEFICIAL INSECTS



NATURES WAY

— the natural solution

One area of particular interest to consumers is pesticide residue levels in food crops. One of the big bonuses of having a home vegetable and fruit garden is that it allows personal control over the selection of plant protection products used.

Gardeners have a range of natural, organic products available.

Yates have co-ordinated this 'environmentally friendly' range — under the Natures Way banner — they include;



NATURES WAY PLANT CARE	
Houseplant Spray	Controls a range of pests on houseplants. The spray shines leaves. There are no spray deposits or offensive smell.
Insect Spray (Concentrate)	A fast acting biodegradable spray — controlling whitefly, aphids and mites.
Fungus Spray	Composed of natural copper and sulphur protecting plants from a range of fungus diseases.
Caterpillar Spray	Active ingredient derived from plant extracts derris and pyrethrum. Quick acting on a range of insects.
Insect Spray (Ready-to-use)	A ready to use trigger spray for controlling insect pests
Mite Spray	A fast acting natural spray. Mites are small and hardly visible and often go unnoticed in the early stages of infestation. They feed by sucking the sap from the tender growing parts of plants. Common symptoms are minute flecks appearing on leaves and flowers and sometimes fine silken webbing. Plants commonly attacked by mites are: roses, orchids, carnations, chrysanthemums, delphiniums, hollyhocks, violets, polyanthus, beans, tomatoes, cucumbers, courgettes, berryfruit, citrus plus pip and stonefruit.

Other organic plant care products include: Derris Dust, Pyrethrum and Thuricide.

NATURAL PLANT FOODS	
Fish Emulsion	Derived from a variety of fish species commonly found off the NZ coast. The nutrients are readily absorbed by plants. Nutrient content: NPK 5.0.5.1. plus trace elements.
Liquid Blood & Bone	An organic fertiliser containing all the essential nutrients for a rich healthy soil, encouraging natural bacterial and worm activity. Ideal for vegetables, fruit, ornamentals and houseplants. NPK 8.3.6 plus trace elements.
Seaweed Extract	A complex concentrate of seaweed species from different parts of the world.
Symbex — Compost Maker	A solution of natural soil bacteria which speeds up the decomposition of compost and improves soil enhancing plant growth.

Other organic plant foods include: Gro Plus Chook Litter and Gro Plus Sheep Pellets.

CHAPTER NINETEEN

PESTS AND DISEASES

MOST PLANTS are subject to attack by pests and diseases. Well grown plants tend to be more resistant, but all are susceptible. It is important to remember that the home garden is an artificial situation, where the concentration of crops creates ideal conditions for the build-up of pests and diseases to undesirable levels.

The most common pests and diseases found in the home garden, and their prevention and control, are described in this chapter.



Tomato fruit worm



Green vegetable bug



Whitefly



Carrot rust fly *Codling moth damage,* *Leaf roller caterpillar damage* *Thrip damage on onio*

CHEWING INSECTS

Bronze Beetle
The bronze beetle is found mainly in warmer areas of New Zealand. It is about 6mm long and feeds on foliage of fruit and ornamental trees over the summer, eating out small holes. Control with Target or Ambush.

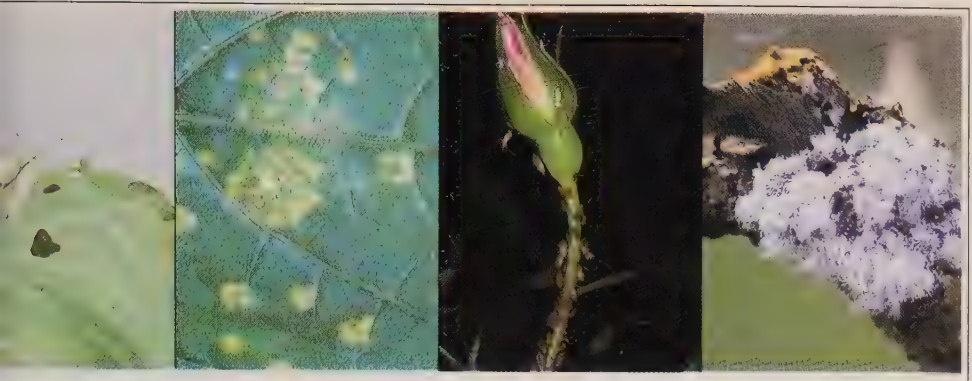
Codling Moth
A common pest of pip fruit. In warmer areas, there may be 2–3 generations over the summer. The moths begin flying in October and the larvae feed on fruit from November through to the end of March. In southern areas there may only be one flight in December. Damage can vary from small 'stings' or blemishes to almost completely hollow fruit. Damage is caused by the larva which enters the fruit anywhere on its surface. It tunnels to the seeds and eats them, causing extensive damage in and around the core. Carbaryl is the most effective control for home gardens but regular applications are necessary. Although varying with regions, trees should be sprayed from mid-November (fruit set) through until early March (harvest) every 14 days. (Note carbaryl should *not* be applied within four weeks of petal fall, or fruit thinning may result. Use Maldison over this period.)

Earwig
A scavenging insect living in the soil, which can damage flowers, stonefruit and other plants. Control with Carbaryl, Target, or Home and Garden Bug Dust.

Grassgrub
The grubs feed on the roots of grasses causing yellow patches and stunted lawn growth. Adult beetles (often confused with the smaller Bronze Beetle) emerge in October/November and feed on foliage taking notch shaped bites. They can cause considerable damage on fruit and ornamental trees. On lawns, apply Lawn Doctor in autumn when damage is obvious or more effectively in spring as the adults are emerging. To control adult beetle on foliage, spray with Target.

Leafroller Caterpillar
There are a number of different types of leafroller caterpillars and they are a serious and common pest in the home garden in New Zealand. They are recognised by their habit of rolling leaves together using silken threads, to make a shelter. They feed on leaves and the surfaces of fruit, where rots may develop on the exposed flesh.

The caterpillars are usually green and vary from 10–25mm in length. As they grow they become well protected in their webbed shelters making them difficult to control. Timing sprays to coincide when eggs are present and when caterpillars are young helps overcome this problem. Suitable sprays include Orthene, Target and Thuricide.



White butterfly and caterpillar **Downy mildew on cucumber** *Rose aphids* *Woolly aphids on apple*

Thrips
A tiny insect barely visible to the naked eye, thrips rasp at the surface of leaves and fruit, leaving a silver appearance. Dark specks of excrement are noticeable on the underside of leaves. Plants commonly attacked include anemones, asters, bottlebrush, photinia, chrysanthemum, dahlias, gladioli, azaleas, rhododendrons, fuchsia, pip fruits, stonefruits and citrus. Several sprays over the summer with Target, Ambush or Orthene are necessary to prevent damage.

Weevil
Weevils are beetles with pronounced snouts. The adults feed on foliage, usually nibbling pieces from the edges of leaves. The grubs live in the soil and feed on plant roots. Strawberries, carnations, roses, citrus and feijoas are commonly attacked. Control adults with Target and grubs with Lawn Doctor.

White Butterfly Caterpillar
White butterfly caterpillars cause most damage to Brassica (cabbage, cauliflower, brussel sprouts) vegetable plants. Small holes appear on outer leaves. Best controlled with Carbaryl, Target, Orthene, Derris or Thuricide.

Carrot Rust Fly
A serious problem in carrots grown in warmer parts of New Zealand. The fly also attacks parsnips, parsley and celery. The maggots cause damage by burrowing into the roots of the plant. Protect with Diazinon Granules applied to the soil prior to seed sowing, in a band 2cm below seed. Infestation may be reduced by practising crop rotation, i.e. do not plant a susceptible crop in the same soil for two years. Alternatively, sterilise soil with Basamid.

SUCKING INSECTS

Aphid
Aphids (or green fly) are small slow-moving insects which may or may not have wings. They feed on the young growing tips of plants, sucking the sap and causing distortion in growth. They build up to enormous numbers in a short time. There are many different species of aphids including the grey cabbage, black citrus, woolly aphis, the pink rose and peach aphid. Control with Orthene.

Green Vegetable Bug
A shield-shaped insect which feeds on many plants including citrus, corn, tomatoes, potatoes, tamarillo and passionfruit. Damage results in shrivelled misshapen growth and brown corky spots on the fruit. Spray with Orthene or Target.

Mealy Bug
Pale insects covered with a white mealy powder. They excrete a honey dew on which a disfiguring black sooty mould grows. There are several species and they



Psyllid on Pittosporum *Scale on citrus* *Grey aphids on cabbage* *Oriental fruit moth d*

can be found on a range of plants, normally on the undersides and base of leaves making them difficult to get at. Some species feed on plant roots. Control with Orthene and Conqueror oil.

Passion Vine Hopper
The adult is about 7mm, long with transparent wings. They are commonly found on passionfruit, figs, citrus, apples and grapes. The oddly shaped nymphs with white fluffy 'tails' appear earlier in the season and feed on succulent parts of the plant. The adults can cause slits in the plant tissue as they lay eggs, resulting in die-back. Control with Orthene.

Psyllid
Commonly found on pohutukawas and pittosporums. The insects affect developing foliage causing severe blistering. They are found on new growth in spring and summer. Control with Orthene or Target.

Scale Insect
Different types of scale insects are found on fruit trees and ornamentals. Infested plants with scale become unthrifty, dehydrated and often discoloured. Some species exude a honey dew on which a sooty mould grows. Conqueror oil combined with Orthene will give best control.

Whitefly
One of the more common and annoying garden pests in summer. Commonly found on tomatoes, beans, cucumbers, melons, geraniums and dahlias. The adults are tiny white insects 1–2mm in length. They are prolific breeders and trying to control them can be frustrating. The adults are controlled with Target or Orthene, which gives a quick knock-down. Regular spraying at seven to ten days gradually eliminates adults as they appear, and before the numbers become too excessive. It is best to commence spraying at first sign before numbers build up.

BORING INSECTS

Lemon Tree Borer
In addition to citrus, this insect also attacks pipfruit and stonefruit, grapes and tamarillos. The borer tunnels into the wood where it feeds. Attacked branches become unthrifty and eventually die. Control is difficult, infected wood should be cut out and burnt, and foliage and stems sprayed with Orthene.

Oriental Fruit Moth
A relatively new pest in northern New Zealand and slowly spreading southwards. Attacks pipfruit and stonefruit and some ornamentals. The caterpillar burrows into the young shoots causing death of the terminal shoots during November and December. Later in the season damage will appear on fruit. The best preventive available to the home gardener is regular spraying with Carbaryl.



Mite damage on beans *Blackspot* *Blight on potatoes* *Brown rot*

MITES

MITES ARE tiny eight-legged animals related to spiders, almost invisible to the naked eye. They feed by sucking, causing spotting and bronzing of leaves and premature leaf fall. Over the summer in the hot dry weather they can become a major problem on fruit trees, ornamentals and vegetables and they are a particular problem in glasshouses. The common mites are: Two-spotted mite which produces a mass of silk webbing; the European Red mite, found mainly on apple trees; and Citrus Red mite, mainly on citrus. Mites are *not* insects and they are *not* controlled by insecticides. Mite Killer used in summer and an oil spray in winter to smother the eggs, give the best treatment.

NEMATODES

NEMATODES OR eelworms are microscopic worm-like creatures which live in the soil. They are most common in light sandy soils and feed on plant roots causing swellings and lack of thrift in plants. They mainly live inside the host plant and cannot be seen unless extracted and examined under a microscope. Nematodes are controlled by sterilising the soil with Basamid. Avoid growing susceptible plants in infested soil.

SNAILS AND SLUGS

SNAILS AND slugs damage seedlings, foliage and flowers of plants. (Some slugs also burrow below the soil and then tunnel into root vegetables.) Damage is most serious in warm, wet weather. Waste areas of long grass and weeds should be cleaned up. A bait should be laid around susceptible plants, e.g. Blitzem or Mesurol, the latter being longer lasting and more effective in wet weather.

FUNGUS DISEASES

FUNGI ARE multi-celled thread-like plants. Many fungi which gain their food from green plants cause disease in the process. They produce large numbers of tiny reproductive bodies called spores which are carried by the wind or water.

Black Spot (Scab)
A common fungus disease on roses, apples and pears. The black or brown spots appear on the leaves causing them to yellow and fall prematurely. Difficult to control once established, but with regular spraying with Saprol, Benlate from spring through to autumn it can be prevented.

Bladder Plum
Japanese plums swell and become spongy and hollow in texture, turn brown and fall to the ground. European plums turn white, have blotches and are hollow. Spray with Copper oxychloride as leaf buds begin to swell in early spring.



Clubroot on cabbage



Botrytis on grape



Leafcurl on stonefruit



Rust on carnations

Blight
Blight is a term commonly used to describe a number of fungus diseases causing death and decay of leaf tissue. More specifically, it is a wet-weather disease of potatoes and tomatoes.

Late blight (*Phytophthora*) first appears as pale areas on leaves and stems, which gradually spread. A white, fringed growth may also be present. As the lesions spread the foliage collapses.

Early blight (*Alternaria*) usually attacks later in the season with small, angular, blackish lesions that gradually enlarge. Several attacks may cause leaves to fall.

Control blight with regular applications of Bravo during periods of warm, wet weather.

Botrytis
Botrytis or grey mould affects a wide range of plants. It is most prevalent during wet or humid weather, causing a grey fur on leaves, stems flowers or fruit. It is a major cause of fruit rot at maturity and after picking. Spray with Bravo or Benlate.

Brown Rot
Affects stonefruit such as peaches, plums and nectarines. Usually occurs on fruit as it nears maturity and when weather is cool and damp. Spray with Bravo from bud burst to harvest at two weekly intervals. The most important sprays are during flowering, immediately after flowering and in the last 3–4 weeks before harvest.

Club Root
A disease of Brassicas: cabbage, cauliflower, broccoli, swede and turnips. The roots become malformed causing the foliage to wilt. Rotating crops, good drainage and the addition of lime will help to prevent the disease. Clubsin applied as a soil drench at transplanting will give protection.

Leaf Curl
This disease affects stonefruit. New leaves thicken and pucker, causing red curling. Spray with Copper oxychloride at bud burst. Follow up with Bravo.

Leaf Spots
Leaf spots can be caused by a variety of organisms including Anthracnose and Septoria. They are easily seen and become most prevalent in wet conditions. Various leaf spot diseases are found on beans, tomato, potato, peppers, carrots, parsnip, silverbeet, polyanthus, iris and ficus. Spray with Manzeb and Bravo.

Downy Mildew
Sometimes appears as grey, white or purplish mould. Affected leaves may yellow or have purplish blotches on the upper surface. Leaves become deformed. Overcrowded seedlings are most susceptible. Commonly found on grapes, roses, cabbages, onions, lettuce, stocks during rainy weather. Spray with Bravo.



wdery mildew on a rose *Powdery mildew on a squash*

Powdery Mildew
Produces a white or grey powdery coating on leaves, stems and buds. A range of plants are susceptible, particularly under conditions of high humidity. Cucumbers, melons, pumpkins, tamarillo, apples, roses, dahlias, zinnias and calendulas are particularly susceptible. Control with Saprol or Benlate.

Rust
Rust usually appears first on the underside of leaves as yellow, orange or white pustules. Upper surfaces show mottled yellowish areas corresponding to pustules. Geraniums and roses are commonly attacked. In recent years it has become a serious disease of poplar trees. The spores are spread by wind or water. Prevent with Saprol, but once well established control is difficult.

Silver Leaf
Silver leaf affects prunus trees: cherries, peaches, plums, apricots, nectarines as well as apples, pears and leucodendrons. The leaves take on a grey silver appearance. Diseased branches should be cut out. As the spore enters the trees through fresh wounds, always prune on a dry day, and cover cuts with pruning paint. Clean tools after use on infected trees. There is no chemical control.

Verrucosis
Affects citrus, in particular lemons, causing corky brown scabs or blisters. Spray with Copper oxychloride at monthly intervals.

BACTERIAL DISEASES

BACTERIA ARE microscopic single-celled plants which are unable to manufacture their own food. Those which cause plant diseases obtain their nutrients from plants. Spores spread rapidly in water or wet weather.

Fireblight
Affects pipfruit and a number of ornamentals including cotoneaster, photinia and pyracantha. Flowers wilt and turn brown in spring and shoots look as if they have been scorched. Twigs, shoots and branches die. All diseased wood should be cut out and burnt during dry weather. Paint pruning cuts, clean tools after use on diseased trees. Avoid feeding with a high nitrogen fertiliser which encourages lush vegetative growth which is particularly susceptible.

Stonefruit Blast
Affects peaches, plums, cherries, apricots, and nectarines causing a rapid die-back of growing tips. Diseased bark turns dark brown-red colour. On a dry day, cut out infected wood and burn. Spray with Copper oxychloride immediately after petal fall and again a month later.

VIRUSES

VIRUSES ARE microscopic organisms which can infect plants and cause disease. Symptoms of infected plants include: stunting, distortion, mottling or striping of leaves, deformed flowers and breaking of colour in flowers. Plants most susceptible are cucumbers, marrows, tomatoes, sweet peas, lilies, daphne, iris, strawberries, peas, apples, pears, roses, peaches and nectarines. Infected plants do not recover naturally, cannot be treated and must be destroyed. Aphids are frequently the vectors (spreading the virus) and a regular spray programme should be used to control them. Weeds can also harbour viruses and should be destroyed. Viruses may also be carried on seed.

The production of High Health plants, which at the time of propagation are free from known viruses, is becoming an important feature in the New Zealand nursery industry. This particularly applies to roses, daphne and nandinas.

PHYSIOLOGICAL DISORDERS

PHYSIOLOGICAL DISORDERS are very common: they are abnormalities in growth caused by an environmental factor, e.g. excessive cold, excessive heat, wind or a nutrition problem. Excessive cold often causes purple or red pigments to develop in leaves of roses and many plants. Yellowing of leaves may occur in other plants, or flower buds do not form properly and flowers are not pollinated. Low temperatures are the main cause of poor pollination in tomatoes and peppers in spring and early summer and can lead to misshapen fruit.

Excessive heat can result in wilting, scorching of leaves, blossom drop in tomatoes and peppers and poor pollination in beans and sweetcorn.

Strong wind can slow down growth, increase moisture loss from plants and cause mechanical injury. Adequate watering is essential. Lack of moisture may cause blossom drop, fruit drop, leaf scorch.

A deficiency of a particular nutrient will also show up as a plant disorder. Molybdenum is likely to be deficient in acid soils and causes whiptail in broccoli, brussel sprouts, cabbage and cauliflower. The leaf blades are narrow and the margins of the leaves thickened and distorted.

A deficiency of magnesium shows symptoms of yellowing between the leaf veins – especially in older leaves. Citrus, grapes, beetroot and tomatoes are particularly susceptible.

Boron may become deficient on alkaline soils. Symptoms usually show on shoots, buds and fruits. Apples brown on the inside, broccoli and cauliflower have hollow stems, beetroot have a heart rot, the stems of silverbeet and celery crack.

Where organic matter and balanced fertilisers are used, trace element deficiencies are not common in the home garden. Water soluble fertilisers such as Lush also contain trace elements and can provide a quick remedy.

The use of balanced formulated fertilisers is much safer and easier than applying trace elements or making up your own mixes.

CONTROL STRATEGIES

SUCCESSFUL PREVENTION and control of pests and diseases starts with the identification of the cause and assessment of the damage or potential damage that may occur. The presence of an insect in the garden, for example, may actually be beneficial or cause insignificant damage to warrant controlling. In situations where the damage to a plant is *not* tolerable, a suitable control method must be sought. There are several strategies which are each suitable under different circumstances.

Cultural Control

Cultural control embraces those activities which discourage the activity and establishment of an insect or disease.

Garden hygiene is most important. Long grass and weeds growing around tree trunks and hedges harbour many pests. These areas should be cleaned up. Diseased plants, fallen leaves and fruit and pruning wood should always be removed and burnt.

Thorough preparation of the soil before planting to ensure plants get a good start encourages good plant health. Summer vegetables sown too early will have poor germination, spindly growth and be susceptible to disease. Seeds sown too thickly will result in thin, weak seedlings also susceptible to disease. If possible avoid growing the same or closely related plants on the same site in successive years. This avoids the build-up of soil-born pests, and diseases like nematodes and club root.

Water management is also important. Plants under moisture stress are more susceptible to pests and diseases. Poorly drained soils lead to root rot and other fungal diseases.

The choice of plants can be critical. Seek local advice as to which plants are

likely to do well under local soil and climatic conditions. The use of disease-resistant varieties of plants is an obvious way of avoiding pests and diseases, e.g. Early Money tomato and Hi Health daphne.

Companion planting, which encourages a variety of plants rather than the growing of the mass or one type together, can also be beneficial in reducing pests and diseases. Some plants are reputed to have a repellent effect on certain pests, e.g. chives and garlic under roses deter aphids, marigolds combat white flies and nematodes. Companion planting is an attractive idea which lends itself to experimentation. The alleged benefits have been based on herbal laws and observations.

Mechanical Methods

Hand removal of insect pests or diseased leaves and fruit where small numbers are involved is a very effective control method. Traps are popular because they give visible results, e.g. yellow cards spread with glue are reputed to attract and trap whiteflies.

Biological Control

Biological control uses natural enemies of pests. It is important to recognise and conserve as many beneficial creatures in the garden as possible. These include:

Birds: which at various stages feed on insects.

Lacewings: small delicate lacy-winged insects which feed on aphids and whitefly.

Ladybirds: which feed on insects.

Frogs and lizards, spiders and wasps.

Cooper's Thuricide is a biological control available commercially. It is based on the bacteria Bacillus Thuringensis which has a toxic effect on caterpillars but is harmless to other insects and animals.

Chemical Control

Chemical control involves the use of chemicals to control the pest or disease. These chemicals are called *pesticides*. Chemical control remains the quickest and most effective method of controlling and preventing pests and diseases. The risk of pesticides has received a lot of exposure in recent years. However, it is misleading to consider all pesticides as dangerous. The danger of the more toxic compounds should be highlighted, but the relatively safer materials should be treated as such. Chemicals available to the home gardener come under much stricter control than those available to commercial growers.

Fortunately some of the older formulations which are highly toxic by today's standards are no longer available, e.g. Lead Arsenate and Nicotine Sulphate. Great strides have been made with pesticides in recent years in making them safer and simpler to use.

Permethrin is one example of a modern synthetic pyrethroid which has been developed. It is safer than naturally occurring pyrethrum, degrades quickly on contact with the soil and is relatively harmless to mammals and birds.

While there are a number of home garden chemicals classified as Poisons and Harmful Substances (along with other common household products such as bleaches, swimming pool chlorine and hydrogen peroxide) most home garden pesticides are of such low toxicity that they are not scheduled.

The registration and sale of home garden chemicals, their packaging and labelling are strictly controlled by the Pesticides Board and Health Department. When using a home garden pesticide, read the label carefully, follow the instructions and you can be assured of spraying without hazard.

PESTICIDES

THERE ARE several different kinds of formulations of home garden pesticides designed for different uses, levels of convenience and expertise.

Ready-to-use, Convenience Formulations

Granules

The pesticide is incorporated in a granule or pellet. They are easy to apply and are ideal for insecticides applied directly to

the soil to control soil insect pests, e.g. Lawn Doctor for control of grass grub, Diazinon 5G to control carrot rust fly.

Dusts
These are formed by diluting powdered pesticides with excess amounts of inert dust. They are applied dry. The coverage is generally not as good as with a wet spray application. With dusting it is difficult to get an even coverage or apply to large plants and dust is easily washed off. However, dust does not need mixing and is simple to apply; it is contained in a puffer or shaker pack which makes dispersing easy, e.g. Rose Dust, Tomato Dust, Derris Dust.

Baits
Baits consist of a mixture of pesticide and materials which are palatable to the pest. The pest is attracted to the bait and the insecticide functions as a stomach poison, e.g. Ratex, Slugex, Blitzem.

Aerosols
Aerosol formulations are convenient to use in enclosed spaces. An aerosol consists of a propellant and pesticide. They tend to be expensive.

Triggers
Trigger formulations are stabilised in a water base. They have the advantage over aerosols in that the solution is applied at room temperature and there are no hydrocarbons involved. The Trigger pack is ready to use and no mixing is required, e.g. Trigger Insect Killer, Trigger Derris.

Concentrates for Specialised Use
These formulations are economical and require diluting.

Emulsifiable concentrates
The pesticide is dissolved in a solvent and emulsifiers are added. These compounds are diluted with water and sprayed onto plants, e.g. Orthene and Shield.

Aqueous Concentrate
Soluble pesticides are formulated in a water base which is further diluted and sprayed on plants e.g. Cooper's Rose Spray.

Wettable Powders
These are made by grinding up solid pesticides with a diluent such as clay. The powder wets readily and disperses in water. Wettable powders once mixed with water should be agitated continuously in the spray tank e.g. Carbaryl, Copper oxychloride and Yates Tomato Spray.

Types of Sprayers
The prime objective of good spraying is to use sufficient pesticide to control the pest, yet minimise wastage. Good equipment for applying is necessary for pesticides to be effective.

Sprayers suitable for use in the home garden come in a wide variety of shapes and sizes. The efficiency of a sprayer is

SPRAYERS		
Type	Operation	Uses and Limitations
Hand atomisers	Continuous hand pumping required.	Suitable for spot spraying and small operations. High pressure cannot be maintained for prolonged use.
Double action	Continuous hand pumping rquired. Spray may be carried in attached bowl or in separate container.	Pumping may become tiring and mobility hindered. Larger units suitable for outdoor spraying.
Pressure sprayers	Sprayer tank is pressured by 30 to 40 pumping strokes. A trigger controls delivery of spray.	Very easy to use and come in a range of sizes from one litre to five litres.

measured by the spray's fineness and force, which ensure a good spread and penetration of the chemical over a large surface area.

The basic types of sprayers available are set out in the chart.

Your choice of sprayer will depend on:

- The area to be covered. If spraying many fruit trees a sprayer with a hand lance of some length is desirable. If you mainly require a sprayer for indoors, a compact handsprayer is more suitable. In general, pressure sprayers are best for ease of operation.
- The volume of spray mix which you can comfortably carry when full.

Buy the best you can afford. A *well cared for* quality sprayer will last indefinitely.

Mixing Sprays

Measuring and mixing sprays is potentially the most hazardous time, as the pesticides are in their concentrated form. *Avoid* inhaling vapours or dust of the concentrate and *always* measure and mix in a well ventilated area, preferably outdoors.

Liquids

When measuring liquid formulations, half fill the sprayer with water, add the required amount of concentrate and top up with water. Little extra agitation is required when using this method. Do *not* be tempted to add more than is directed on the label. Emulsifiable concentrates can cause damage to foliage under certain conditions, e.g. on soft tender growth, high temperatures/direct sun.

Powders

Weigh out the required amount of powder, add an equal amount of water and mix to a smooth paste. Gradually add more water and try to avoid lumps. It is best to mix in a separate container and pour into sprayer through a strainer, e.g. muslin cloth. Agitate thoroughly when spraying to ensure powder does not settle. Some wettable powders are available in preweighed sachets, making them more convenient to use.

Not all spray chemicals are compatible. Combining some chemicals will cause a physical or chemical change and result in either a decrease in effectivness of compounds, or plant injury. Check labels for special instructions about compatibility if you wish to combine different sprays.

Compatibility Chart

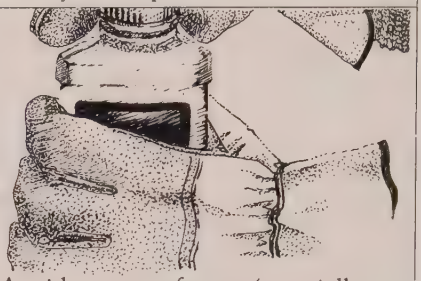
	Benlate	Bordeaux	Bravo	Carbaryl	Conqueror Oil	Copper Oxychloride	Lime Sulphur	Maldison	Manzeb	Orthene	Mavrik	Target
Benlate		■					■					
Bordeaux	■		■	■	■	■	■	■	■	■	■	■
Bravo		■			■		■					
Carbaryl		■					■					
Conqueror Oil		■	■				■					
Copper Oxychloride		■					■					
Lime Sulphur	■	■	■	■	■	■		■	■	■	■	■
Maldison		■					■					
Manzeb		■					■					
Orthene		■					■					
Mavrik		■					■					
Target		■					■					

■ Do not mix ▨ Mix with caution and use immediately. Do not use on tender plants. □ Safe to mix

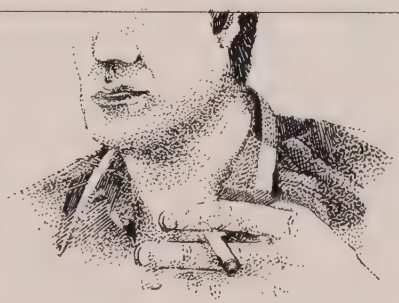
USING HOME GARDEN PESTICIDES – A few simple rules



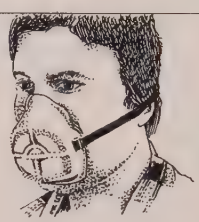
• Read directions carefully before using, and use only for the purpose stated on the label.



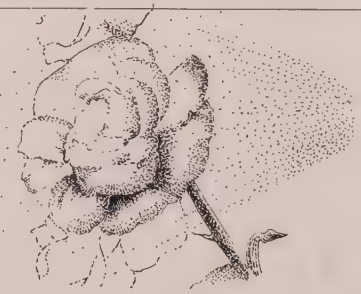
• Avoid contact of spray (especially in concentrated form) or dust with skin.



• Avoid eating or smoking when spraying or dusting.



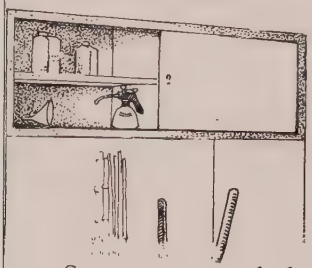
• Avoid breathing fumes from sprays or dusts and always mix outside. (Spray masks are available with charcoal filters which deactivate the chemical.)



• Avoid spraying or dusting on windy days – a calm day is best.



• Rinse spray equipment thoroughly after use and wash face and hands with soap and water.



• Store sprays and dusts out of reach of children or in a locked cupboard.



• Do not harvest sprayed vegetable and fruit crops earlier than the withholding period stated on the pesticide label.

Application of Sprays
Pesticides should be viewed as a tool to assist in maintaining a healthy garden. For efficient use consider the following:
• Choose the correct material and apply as per the label.
• Ensure the product hits the 'target', e.g. under leaves for mites and mealy bug.
• Spray during still conditions during morning or evening, as there is less chance of drift to other plants.
• Do not apply insecticides to crops when bees are visiting – they are helping your garden.
• As a rule apply fungicides prior to rain for protection of the crop from fungi and insecticides after rain.
• Only mix enough spray to do the job. *Never* keep any left-over, diluted spray. Apart from being unsafe to store, most sprays are unstable in water after 24–48 hours.

Withholding Periods for Pesticides
A withholding period is the time that must elapse between the spraying and harvesting of a treated food crop. A withholding period is set by Health Department toxicologists for each product and depends on:
• the toxicity of the product
• the length of time it remains active on the plant
• the type of crop.
The withholding period is not an indication of how long the product remains effective.

WITHHOLDING PERIODS FOR PESTICIDES

Pesticide	Withholding Period	Effective
Benlate®	7 days (lettuce 21: bean 14: berryfruit and tomatoes 3)	7–14 days
Bordeaux	Nil	7–14 days
Bravo®	7 days (pumpkins, cucumbers, melons and strawberries 1 day)	7–14 days
Captan	Nil	7–10 days
Carbaryl	1 day (tomatoes nil)	10–14 days
Conqueror Oil	Nil	10–14 days
Copper Oxychloride	Nil	10–14 days
Derris Dust	1 day	2–7 days
Gardenmaster	7 days	5–7 days
Lime Sulphur	Nil	7–10 days
Maldison	3 days	3 days
Manzeb	7 days (tomatoes nil)	7–10 days
Orthene®	7 days	7–14 days
Saprol®	1 day (stonefruit, tamarillos, pumpkins, cucumbers, melons and grapes 7)	7–14 days
Shield®	7 days	7–14 days
Target®	3 days (citrus 14: grapes 28)	7–10 days
Tomato Spray	7 days (tomatoes nil)	7–10 days

Register of Plant Protection Products
This register lists plant protection products available in New Zealand by their active ingredient.

Chemical Name	Trade Names	Main Uses
acephate	Orthene	Insecticide – broad spectrum, systemic.
amitrole	Amitrole	Weedkiller – controls most broadleaf weeds and grasses. Leaf absorbed and translocated.
benomyl	Benlate	Fungicide – broad spectrum, systemic.
bentazone	Prickle weedkiller	Controls Onehunga weed in lawns.
beta-indolylbutyric acid	Seradix	Rooting hormone.
bromofenoxim	Faneron 50	Selective herbicide controls most broad-leaf seedlings. Particularly effective against Onehunga weed.
calcium hydroxide/copper sulphate	Bordeaux	Fungicide.
captan	Captan	Protectant fungicide.
carbaryl	Carbaryl	Insecticide. Particularly effective against chewing insects.
chlorothalonil	Bravo	Fungicide – broad spectrum.
copper oxychloride	Copper Oxychloride, Copperox	Fungicide and bactericide.
dazomet	Basamid	Soil sterilant – controlling soil fungi, insect nematodes and weed seeds.
diazinon	Diazinon 5G	Soil insecticide.
dicamba, 24D	Woody Weedkiller	Selective weedkiller. Hormone. Controls broad leaf weeds.
2,2,dichloro propionic acid	Dalapon	Selective herbicide controlling most grasses.
cupric hydroxide	Champion	Fungicide - used on a wide range of garden plants.

GARDEN PESTICIDES		
Chemical Name	Trade Names	Main Uses
diclorophen	Mostox	Moss killer.
fluvalinate	Mavrik	Insecticide broad spectrum synthetic pyrethroid safe to bees.
glyphosate	Network, Round-up	Non selective herbicide.
lime sulphur	Lime Sulphur	Lichen and fungus diseases
maldison	Maldison, Malathion	Broad spectrum insecticide.
manzeb	Manzeb	Fungicide protectant.
MCPA/Mecoprop	Turfix, Lawnmaster, Trigger Lawn Weeder	Selective herbicide controlling broad leaf weeds.
metaldehyde	Blitzem	Slug and snail bait.
methiocarb	Mesurol	Slug and snail killer.
myclobutanil	Fungus Fighter	Broadspectrim fungicide.
permethrin	Trigger Ant & Spider spray	Broad spectrum insecticide.
pirimiphosmethyl/ permethrin	Target	Broad spectrum insecticide.
propham	No Sprout	Prevents sprouts forming on potatoes during storage.
rotenone	Derris Dust	Organic insecticide.
sodium chlorate	Universal Weedkiller	Non selective herbicide.
thiophanate-methyl	C. General Fungicide Spray	Fungicide – systemic.

YATES PESTICIDE RANGE

(A) Insecticides	Formulations	Controls	Active Ingredient
Carbaryl	Wettable powder. Mix with water. **Note:** Do not mix with lime sulphur, bordeaux or oil.	Codling moth, caterpillars, mealybug, leaf curling midge, brown beetle, earwig, potato tuber moth, tomato caterpillar, thrips, earthworms.	800g/kg carbaryl
Conqueror Oil	Emulsifiable liquid concentrate, mix with water. **Note:** Do not mix with sulphur sprays, captan or Bravo.	Mites, scale, mealy bug.	970ml/litre mineral oil.
Derris Dust	An organic dust derived from plant extracts, in ready-to-use form. Available in shaker and puffer pack.	Caterpillars, leaf hoppers.	5g/kg rotenone
Diazinon	Granule in ready-to-use form. Available in sachet and puffer pack.	Carrot rust fly, grass grub, porina caterpillar. Fly maggots, slaters, ants, wasps, crickets.	50g/kg diazinon
Home & Garden Bug Dust	Ready to use dust	Earwigs, ants, slaters, fleas, silverfish, carpet beetle, spiders, caterpillars	10g/kg permethrin
Insect Dust	Ready to use dust	Aphids, thrips, green vegetable bug, caterpillars	40g/kg carbaryl 20g/kg maldison
Lawn Doctor	Granule in ready-to-use form. Available in shaker pack.	Grass grub.	150g/kg lindane
Liquid Derris	Emulsifiable liquid concentrate. Mix with water.	Caterpillars, thrips, aphids, earwigs, ants.	30g/litre rotenone 3.7g/litre pyrethrum 15.1g/litre piperonyl butoxide
Maldison	Wettable powder. Mix with water. **Note:** Do not mix with bordeaux or lime sulphur.	Short-term control of caterpillars, aphids, thrips, leaf hoppers, mealybug, scale beetles, springtail crickets.	250g/kg maldison
Mite Killer	Flowable liquid concentrate. Mix with water.	European red mite, two-spotted mite.	80g/litre dicofol
Orthene®	Emulsifiable liquid concentrate. **Note:** Do not mix with lime sulphur or bordeaux.	Aphids, caterpillars, mealybug and others.	195g/litre acephate

Poison Classification	Benefits
Poison	Controls wide range of insects particularly chewing insects. Recommended all crops, vegetables, fruits and flowers. Use close to harvest – one day withholding period; can be used on lawns when earthworms are troublesome.
Not scheduled	Controls scale and mites. Acts by smothering slow-moving insects and eggs and there is no risk of the build-up of resistance. Suitable for summer and winter use. Use as indoor plant polish. Can be used up to and during harvest.
Not scheduled	Controls white butterfly. Quick acting, easy to apply – just shake on; safe to use up to one day before harvest; organic – derived from plants. Ideal for smaller gardens.
Not scheduled	Controls wide range of soil insects, particularly suitable for use on carrots and lawns. Easy-to-use granules – clean and dust-free. Remains effective up to two weeks.
Not scheduled	Controls most household insects. Easy, ready to use. Residual action up to two months.
Not scheduled	Controls both chewing and sucking insects. Ready to use dusting powder.
Harmful Substance	Convenient shaker pack; longlasting. Effective on adults and larvae.
Poison	More efficient than dust – quicker knockdown; better coverage; adheres to plant better; controls a wider range of insects; organic, derived from plant extracts; more economical than Trigger Derris.
Harmful Substance	Controls wide range of insects particularly those feeding by sucking. Wettable powder suited to tender ornamentals and vegetables. Emulsion is slightly more persistent.
Not scheduled	Only mite killer available to home gardener. Effective against nymphs and adults. Does not affect predator mite. Easy-to-mix liquid.
Poison	Controls wide range of insect pests. Long lasting and weather resistant protecting from within the plant; good on difficult-to-get-at insects such as thrips, leaf roller and mealybug. Easy-to-mix liquid concentrate. (Has thinning effect on stonefruit.)

YATES PESTICIDE RANGE			
(A) Insecticides	Formulations	Controls	Active Ingredient
Pestmaster	Wettable powder. Mix with water.	Aphids, thrips, green vegetable bug, leaf hopper	120g/kg maldison 30½g/kg carbaryl 44g/kg dicofol
Pyrethrum	Emulsifiable liquid concentrate. Mix with water.	Aphids, whitefly, mealybug, caterpillars, earwigs.	14g/litre pyrethrum 56.5g/litre piperonyl butoxide
Target®	Emulsifiable liquid concentrate. Mix with water. **Note:** Do not mix with lime sulphur, bordeaux.	Whitefly, aphids, scale, mealybug, leaf roller caterpillars.	95g/litre perimiphos 5g/litre permethrin
Thuricide®	Wettable powder. Mix with water. **Note:** Do not mix with bordeaux or lime sulphur.	Caterpillars	Bacillus thuringensis
Trigger Ant Killer	Ready-to-use liquid in trigger sprayer.	Ants, fleas, earwigs, spiders, silverfish, lice, carpet beetle, carpet moth.	2.5g/litre permethrin
Trigger Derris	Ready-to-use liquid in trigger sprayer.	Organic insecticide controlling caterpillars, aphids, thrips, green vegetable bug, earwigs, ants.	0.484g/litre rotenone 0.238g/litre pyrethrum 0.96g/litre piperonyl butoxide
Trigger Insect Killer	Ready-to-use liquid in trigger sprayer.	Tomato fruit worm, caterpillars, whitefly	0.1g/litre permethrin
(B) Fungicides	Formulation	Controls	Active Ingredient
Benlate®	Wettable powder. **Note:** Do not mix with lime sulphur.	Blackspot, canker, sclerotinia, leaf mould, powdery mildew brown rot, botrytis, peach scab.	500g/kg benomyl
Bordeaux	Wettable powder. Mix with water. **Note:** Do not mix with other pesticides	Range fungus diseases	30g copper sulphate 40g calcium hydroxide
Bravo®	Suspension concentrate **Note:** Do not mix with lime sulphur, bordeaux or oil.	Blight, brown rot, leaf curl, septoria leaf spot, downy mildew, dryberry, botrytis leaf spot, powdery mildew, black spot, rust.	500g/litre chlorothalonil

Poison Classification	Benefits
Harmful Substance	Controls insects and mites.
Not scheduled	Kills most insects on plants, but no lasting effect. Organic, derived from plant extract. Quick acting giving rapid knockdown of insects; no toxic residues, can be used up to and during harvest. Breaks down rapidly; can spray on flowering plants in evening without affecting bees working the next day.
Not scheduled	Fast acting, wipes out whitefly quickly. Moves through the leaf (translaminar); ideal for vegetables as can be used close to harvest; easy-to-mix liquid concentrate.
Not scheduled	Controls caterpillars. A naturally occurring bacteria: nil withholding period and can be used up to and during harvest. Harmless to bees, can be applied to plants when in flower. Convenient sachet packets.
Not scheduled	Controls most household insects, cleaner and easier to use than baits, does not stain or taint. Has residual action for up to two months.
Not scheduled	More efficient than dust, giving quicker knockdown; better coverage; adheres to plant better; controls a wider range of insects. Organic, derived from plant extracts.
Not scheduled	Controls caterpillars, easy to use, no wastage, ideal for spot spraying, no harmful propellents or solvents, no mixing.
Classification	Benefits
Not scheduled	Systemic fungicide controlling a range of diseases.
Not scheduled	Copper oxychloride is often prefered as it is easier to mix and not so hard on the plant.
Not scheduled	Controls the widest range of fungus diseases superceding other fungicides; weather resistant and is redispersed in the rain. Easy-to-mix liquid

YATES PESTICIDE RANGE			
(B) Fungicides	Formulations	Controls	Active Ingredient
Clubsin	Flowable liquid concentrate. Mix with water. **Note:** Do not mix with lime sulphur or bordeaux.	Clubroot, brown rot, black spot, powdery mildew, botrytis, sclerotinia	100g/litre thiophanate methyl
Copper Oxychloride	Wettable powder. Mix with water.	Black spot, fire blight, canker, leaf curl, shothole, bacterial blast, verucossis, brown rot, melanose, downy mildew, leaf spot, rust, seed rots, early blight, late blight.	500g/kg copper oxychloride
Cosan®	Wettable powder. Mix with water. **Note:** Do not mix with maldison emulsifiable concentrate or oil sprays.	Powdery mildew, leaf curl, blackspot scab and Erinose mite.	800g/kg sulphur
Lime Sulphur	Liquid concentrate. Mix with water **Note:** Do not mix with other pesticides.	Powdery mildew, black spot, rust, scale, moss, lichen.	150g/litre sulphur as polysulphides of lime.
Fungus Fighter	Aqueous concentrate. Mix with water.	Blackspot, powdery mildew, rust.	12g/1 myclobutanil
(C) Combination Pesticides	Formulations	Controls	Active Ingredient
Fruit Tree Spray	Wettable powder. Mix with water	Range of fungus diseases and insect pests	120g/kg captan 120g/kg carbaryl 45g/kg dicofol 60g/kg maldison 120g/kg sulphur
Gardenmaster	Wettable powder. Mix with water. **Note:** Do not mix with lime sulphur bordeaux or oils.	Blight, black spot, leaf spot, mildew, grey mould, rust, anthracnose, aphids, thrips, beetles, caterpillars, crickets, earwigs, weevils, mites.	100g/kg carbaryl 60g/kg maldison 120g/kg sulphur 44g/kg dicofol 128g/kg mancozeb
Rose Dust	Dust ready to use	Black spot, powdery mildew, aphids, caterpillars, beetles	50g/kg captan 40g/kg carbaryl 20g/kg maldison 120g/kg sulphur
Rose Spray	Flowable liquid concentrate. Mix with water. **Note:** Do not mix with other pesticides.	Aphids, caterpillars, mites, powdery mildew, downy mildew, black spot, rust.	42.5g/litre lindane 127.5g/l chlorothalonil 34g/litre thiophanate methyl 34g/litre dicofol

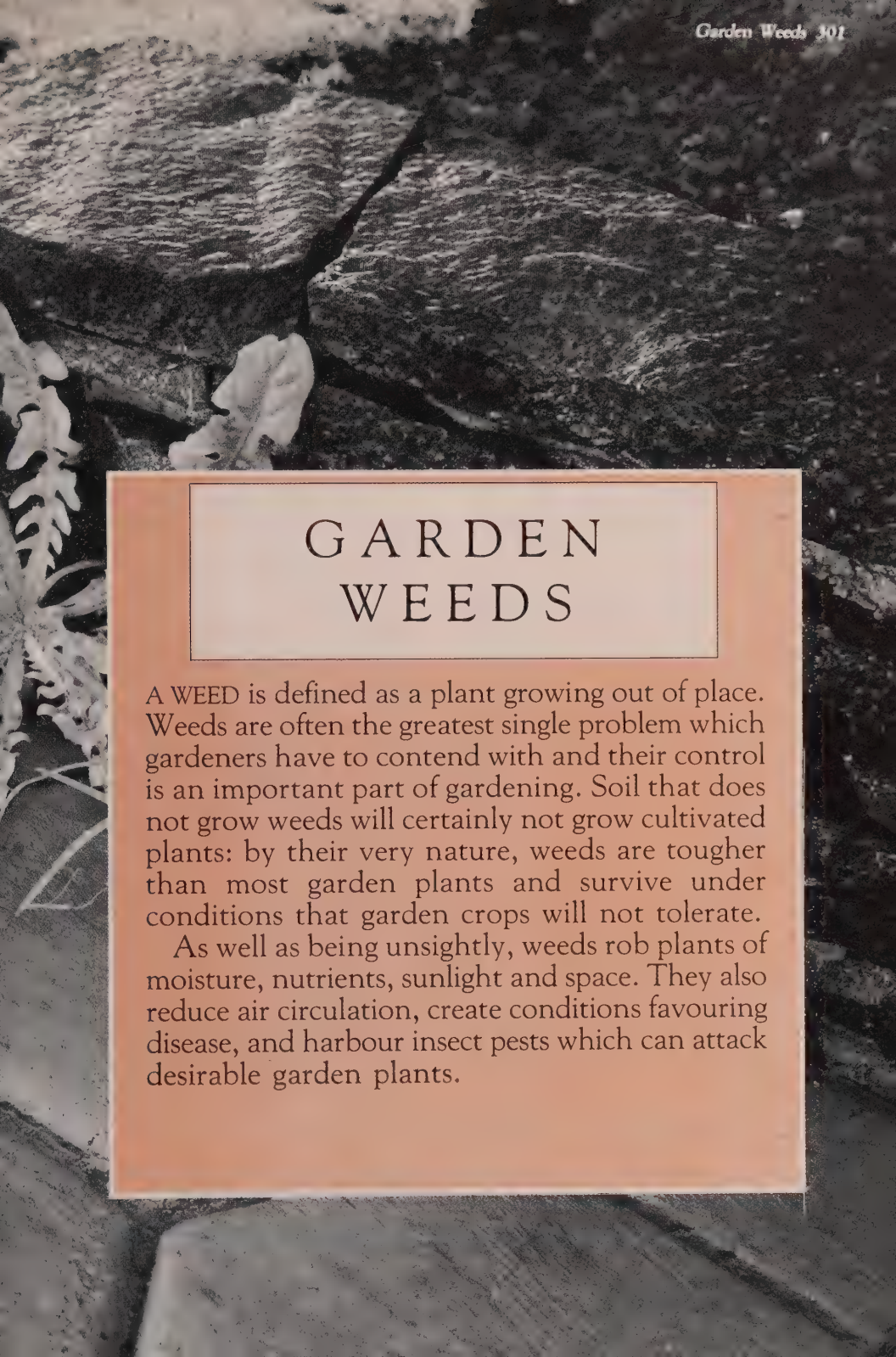
Poison Classification	Benefits
Not scheduled	Only fungicide controlling clubroot; use on vegetables, fruit and ornamentals; effective in adverse weather.
Not scheduled	Controls fungus and bacterial diseases; excellent winter clean-up spray. No residues, can be used up to and during harvest. Easier to mix than bordeaux and not so 'hard' on the plant.
Not scheduled	Protective fungicide. Very fine particles which stay in suspension longer. Harmless to bees. Can be used up to and during harvest.
Not scheduled.	Controls fungus diseases, moss and lichen.
Not scheduled	Broadspectrum fungicide with systemic, curative and protectant activity against a range of diseases.
Poison Classification	Benefits
Not scheduled	Combination spray controlling wide range of pests.
Not scheduled	Controls common pests and diseases in one application; use on fruit, vegetables and ornamentals. Convenient pre-measured sachets.
Not scheduled	Ready to use combination insecticide and fungicide especially formulated for rose growers.
Poison	Provides insect, mite and disease control. Easy to mix.

YATES PESTICIDE RANGE			
(C) Combination Pesticides	Formulations	Controls	Active Ingredient
Shield (for use on roses and ornamentals)	Emulsifiable liquid concentrate. Mix with water. **Note:** Do not mix with lime sulphur or bordeaux.	Black spot, rust, powdery mildew, aphids, caterpillars.	183g/litre triforine 114g/litre acephate
Tomato Dust	Dust ready to use	Blight and insects	40g/kg carbaryl 20g/kg maldison 50g/kg mancozeb
Tomato Spray	Wettable powder. Mix with water. **Note:** Do not mix with lime sulphur, bordeaux or oils.	Tomato fruit worm, black spot, caterpillars, thrip, aphids, blight, chocolate spot, downy mildew, leaf spot.	192g/kg carbaryl 192g/kg mancozeb
(D) Slug and Snail Killers			
Blitzem	Bait	Slugs and Snails	30g/kg metaldehyde
Mesurol®	Bait	Slugs and Snails	methiocarb

Poison Classification	Benefits
Not scheduled	Highly efficient spray controlling wide range of pests and diseases. Combination of Saprol and Orthene; gives persistent control even in wet weather; gives foliage a healthy shine, leaving no spray deposits; developed especially for roses, but suitable for other plants; easy to mix liquid concentrate.
Not scheduled	Ready to use combination insecticide, fungicide especially formulated for tomatoes
Harmful Substance	Controls common pests and diseases of tomatoes, suitable other vegetables and ornamentals; low unit cost.
Harmful Substance	Controls slugs and snails. Fast acting; contains animal repellant; low unit cost.
Poison	Controls slugs and snails. Long lasting (one treatment lasts two to four weeks); rain resistant pellet; antidote available for accidental poisonings.

REGISTERED TRADE NAMES APPEARING IN THIS BOOK	
Benlate®	E.I. DuPont de Nemours and Co. Inc. Wilmington, Delaware 19898, U.S.A.
Bravo®	Fermenta Plant Protection, U.S.A.
Orthene®	Chevron Chemical Co., San Francisco, U.S.A.
Target®	Imperial Chemical Industries PLC, Plant Protection Division, Fernhurst, England.
Faneron®	Ciba-Geigy Ltd, Basle, Switzerland
Basamid®	BASF Ag Federal Republic of Germany.
Champion®	Agtrol Chemical Products, U.S.A.
Mostox®	May & Baker New Zealand Ltd.
Seradix®	May & Baker New Zealand Ltd.
Sumicidin®	Sumitomo Chemical Co., Japan.
Network®	Shell Chemicals New Zealand Ltd.
Prefix®	Shell Chemicals New Zealand Ltd.
Roundup®	Monsanto Co, U.S.A.
Mesurol®	Bayer AG, Federal Republic of Germany.
Thuricide®	Sandoz Crop Protection Ltd, Basle, Switzerland.
Cosan®	Riedel-de-Haen AG, Federal Republic of Germany.





GARDEN WEEDS

A WEED is defined as a plant growing out of place. Weeds are often the greatest single problem which gardeners have to contend with and their control is an important part of gardening. Soil that does not grow weeds will certainly not grow cultivated plants: by their very nature, weeds are tougher than most garden plants and survive under conditions that garden crops will not tolerate.

As well as being unsightly, weeds rob plants of moisture, nutrients, sunlight and space. They also reduce air circulation, create conditions favouring disease, and harbour insect pests which can attack desirable garden plants.

THE AVERAGE garden has many thousands of weed seeds in each square metre of soil. These are introduced by wind, animals or birds, or brought in by water or in soil. Most common weeds produce enormous numbers of seeds which germinate quickly or lie dormant in the soil for many years. Every effort should be made to stop weeds from going to seed. The old adage 'one year's seeding is seven years' weeding' is very true.

There are two basic methods for controlling weeds, either by hand cultivation or by weedkillers.

CONTROL BY CULTIVATION

Hand Weeding

Hand weeding is the oldest method of controlling weeds. It is very effective against weeds which can easily be uprooted and it is often the only appropriate method for vegetable, flower and rock gardens containing a large number of valuable plants. Hoeing can be done more rapidly than hand pulling and it is effective against annual and biennial weeds.

Most seeds germinate in the top 2–3 cm of soil. Deep cultivation should be avoided, because it brings weed seeds up from below this depth and provides ideal conditions for them to germinate, contributing to the problem.

A knowledge of the growth habit of weeds can greatly help in the choice of a suitable method of control. Cleavers is a troublesome weed when its travelling shoots become entwined with cultivated plants; however it can be easily killed by hand breaking the thin stem at ground level, so that it is not necessary to move the root system. In contrast, the well-developed tap root of a weed such as dandelion and dock must be removed if you wish to control it. If the root is not dug out, the weed will simply regenerate from the buds on the lower part of the root.

Mulching

A mulch is a material placed on the soil surface around plants. If it excludes light



it can be used to suppress weeds as well as conserve moisture. Suitable mulching materials include peat, garden compost, hay, sawdust, straw, lawn clippings, bark chips and black polythene. A mulch should be spread over the garden in a layer thick enough to exclude light.

Ground Cover Plants
Ground cover plants which spread or creep over the ground to form a dense living carpet of foliage will also suppress weeds. Before any planting is done it is important to ensure that the site is free from weeds. The choice of plant will be influenced by the amount of sun or shade and the type of soil and the climate. Common plants used are ivy, ajuga, cotoneasters, coprosma, agapanthus and various prostrate conifers.

CONTROL WITH WEEDKILLERS

IN RECENT years easy-to-use weedkillers have become available to make the job of weed control far less time consuming. They are particularly useful around trees and shrubs and on drives, paths, under hedges and waste areas.

APPLICATION OF WEEDKILLERS

A FEW weedkillers are applied as granules but most are formulated so that they can be diluted with water and applied with a sprayer or watering can. Alternatively, the ready-to-use Trigger weedkillers can be used. When using weedkillers it is important to first identify the weed so that you can select a weedkiller which is effective against that particular plant. The

WEEDKILLERS FOR SPECIFIC SITUATIONS

Site	Weedkiller	Effect
New section	Roundup	Kills a wide range of plants. Very effective on paspalum and kikuyu. Not effective on clover, mallow or Tradescantia. Leaves no soil residue.
Driveways and waste areas	DAS Trigger Path Weed Spray Roundup	Long-term control of a wide range of weeds and grasses for 6–8 months. Not effective against paspalum or kikuyu. Treated areas cannot be planted for 12 months. Can be used around established trees and shrubs. See above.
Vegetable garden	Roundup	See above.
Shrubberies and rose beds	Roundup	See above.
Lawns	Trigger Lawnweeder Turfix Woody Weedkiller Faneron® and Prickle Weed Killer	Most weeds, including clovers in grass lawns. Ideal for spot spraying. Controls most broadleaf weeds in lawns. Controls most broadleaf weeds in lawns. Excellent control of Onehunga weed at all stages of growth without harming grasses. Best used in October/November.

situation where weeds are growing must also be considered: weeds in the vegetable garden require a different chemical from those growing in a driveway or paved area where permanent control is advantageous. The correct application rate for the weedkiller is critical. The amount of active ingredient applied to a given area is more important than the amount of water, which merely acts as an agent to disperse the weedkiller.

Weedkillers are most effective when applied to young, vigorously growing weeds. Do not apply to long lank growth or during drought when growth is minimal.

To ensure you get complete foliage coverage, even distribution and good penetration of the chemical into the leaf, particularly on waxy or hairy leaf surfaces, Spray Fix surfactant should be used.

Some weedkillers take time to show effect: Roundup and Amitrole can take three to four weeks to work. In slow-growing conditions this can be even longer – so do not be too impatient.

Systemic or Translocated Weedkillers
These weedkillers are leaf-absorbed and enter the plant and move within them while they are still growing. They are necessary for controlling perennial weeds with strong root system, e.g. Roundup, Amitrole.

Hormone Weedkillers
Hormone weedkillers contain plant growth regulating components and are selective in their action. At low rates they only kill broad leaf plants and at high rates both grasses and broad leaf plants.

Non Selective Broad Spectrum Weedkillers
A non-selective broad spectrum weedkiller will kill all or most plants in a treated area, e.g. Das and Roundup.

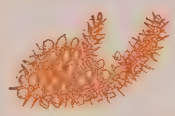
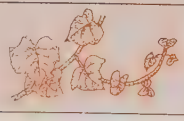
Selective Weedkillers
A selective weedkiller will only kill some of the plants in a treated area. The remaining plants will have a tolerance of the chemical, e.g. Turfix controls broad leaf weeds without harming grass lawns.

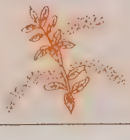
SELECTIVE WEEDKILLERS

	Active Ingredient	Action	Soil Residue	Uses
Woody Weedkiller	2–4D and dicamba	Hormone, slow-acting	6 mths. Do not compost lawn clippings for 3 mths.	Controls broad-leaf weeds, Onehunga weed, daisy, waxweed, convolvulus, fennel, honeysuckle, dock, willows, privet, tree stumps.
Turfix	MCPA mecoprop	Hormone, slow-acting		Controls broad leaf weeds including clover in lawns. Use in spring and autumn.
Faneron®	bromofenoxin	Rapid control of seedlings, flat weeds		Excellent specific weedkiller for Onehunga weed in lawns. Effective in all stages. Also controls seedlings, chickweed, chamomile, pennyroyal, parsley piert, daisy. Use in October/November on warm days.

CONVENIENT READY-TO-USE WEEDKILLERS				
	Active Ingredient	Action	Soil Residue	Uses
Trigger Path Weed Spray	amitrole simazinc	Leaf absorbed and translocated	3–12 months	Most broad-leaf weeds and grasses. Especially effective on difficult weeds such as bamboo, couch, mercer grass, wandering jew, indian, doab, periwinkle, wild onion, sheeps sorrel, cape ivy, docks.
Trigger Lawn Weed Spray	MCPA mecoprop	Hormone, slow-acting	Use in spring and autumn	Controls broad-leaf weeds including clover in lawns.

BROAD SPECTRUM WEEDKILLERS				
	Active Ingredient	Action	Soil Residue	Uses
Amitrole	amitrole	Leaf-absorbed and trans-located	0–4 weeks depending on soil type and weed cover	Most broad leaf weeds and grasses. Especially effective on difficult weeds such as bamboo, couch, mercer grass, wandering jew, indian, doab, periwinkle, wild onion, sheeps sorrel, cape ivy, docks.
DAS	dalapon amitrole simazine	Leaf and root absorbed and translocated	Prevents germination for 6–8 months	Best long-term (6–8 mths) broad spectrum weedkiller. Wastelands paths, drives and fence lines. Can be used around mature trees. Add Roundup if paspalum or kikuyu present.
Universal Weedkiller	sodium chlorate	Contact and root absorbed	3–4 mths. Heavy soils up to 12 months	Wasteland, paths, drives and fence lines.
Roundup®	glyphosate	Leaf-absorbed and trans-located	No soil residue inactivated by soil.	Good all-round weedkiller particularly when used at planting and sowing time. Will not control clover or mallow.

COMMON WEEDS AND HOW TO CONTROL THEM		
Weed	Weedkiller	Application
Bamboo 	Amitrole or Roundup®	Spray on vigorously growing young foliage or apply to new spears after cutting off tips.
Clover 	Woody Weedkiller, Amitrole	Spray in full leaf.
Convolvulus 	Woody Weedkiller	Spray in full leaf.
Docks 	Woody Weedkiller, Amitrole, Trigger Weedkiller	Spray in full leaf.
Fennel 	Woody Weedkiller, Amitrole	Spray in full leaf, preferably before flowering.
Flax 	Woody Weedkiller	Most effective when sprayed on young growth after cutting.
Ginger Plant 	Amitrole	Difficult, May need repeat application.
Gorse 	Amitrole/Roundup®	Spray when in active growth. Good coverage is essential.
Grasses 	Roundup® DAS	Spray when in active growth
Ivy 	Woody Weedkiller	Apply when in full leaf or paint liberally on freshly cut stump.

COMMON WEEDS AND HOW TO CONTROL THEM		
Weed	Weedkiller	Application
Honeysuckle Vine 	Woody Weedkiller, Amitrole	Spray when in full leaf.
Kikuyu 	Roundup®	Spray when in full leaf.
Moss in lawns and paths 	Mostox®	Water or spray on.
Onehunga weed 	Faneron®	Spray in spring when soil temperature has warmed and before the plant sets seed.
Onion weed 	Amitrole, Trigger Weedkiller	Spray in full leaf and when growing vigorously.
Oxalis 	Basamid® (Soil Sterilant) Roundup®, Amitrole	Use in gardens where all plants can be removed while treating. Spray in full leaf. Will need repeat application.
Paspalum 	Roundup®	Spray in full leaf.
Periwinkle 	Amitrole, Woody Weedkiller	Apply in full leaf.
Privet 	Woody Weedkiller	Apply to stumps to prevent resprouting.
Wandering Jew *Tradescantia* 	Amitrole	Apply when in full leaf and growing vigorously.
Willows 	Woody Weedkiller	Apply to smooth green bark all around the stem. Paint on stumps to prevent resprouting.



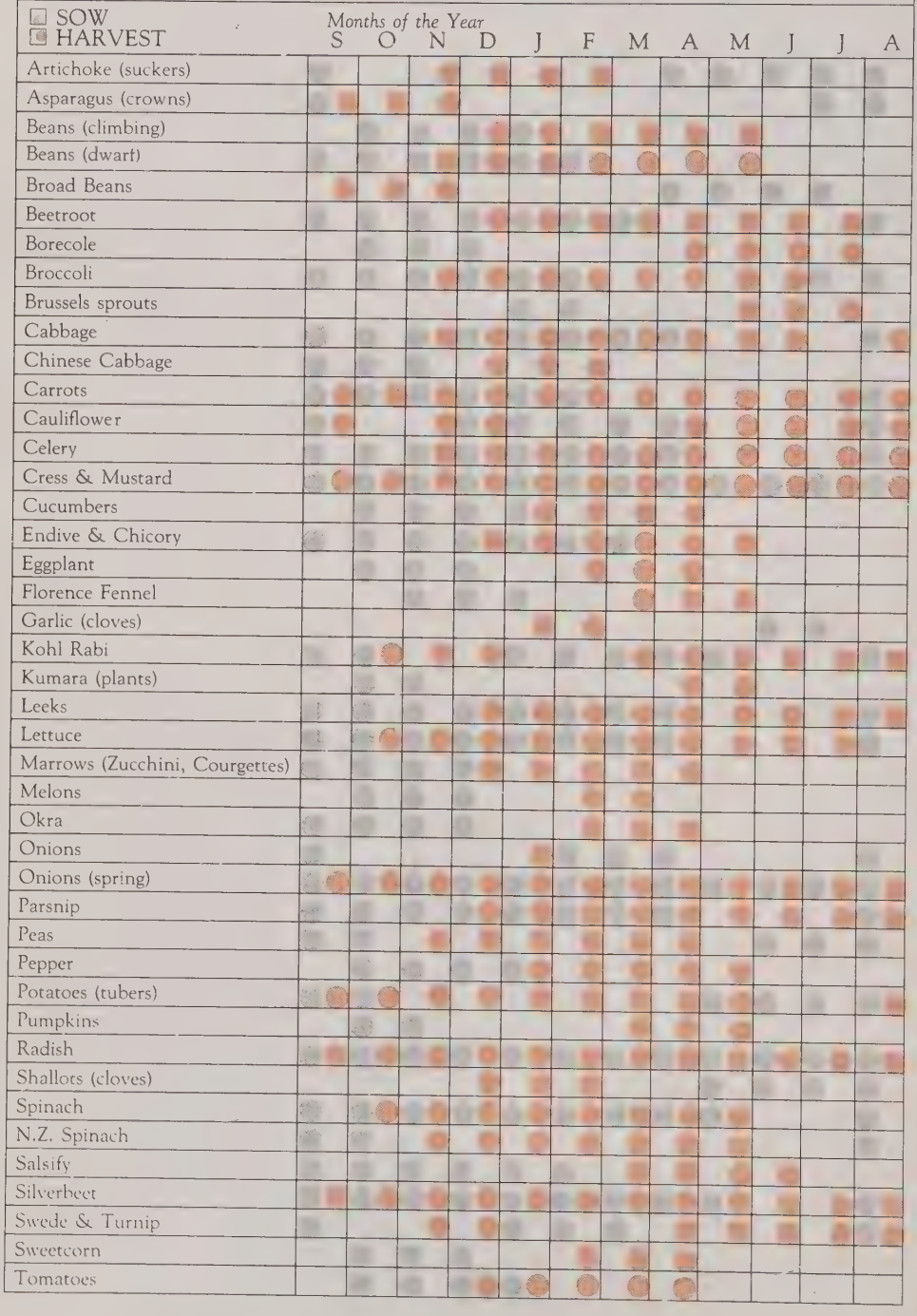


YOUR GARDENING CALENDAR

THE VEGETABLE CALENDAR

YOU CAN plan a succession of planting which will provide a harvest over an extended period. Timing varies with climate and variety of vegetable.

SOWING AND HARVEST GUIDE FOR AUCKLAND



SOWING AND HARVEST GUIDE FOR CHRISTCHURCH													
☐ SOW ☐ HARVEST	*Months of the Year*												
	S	O	N	D	J	F	M	A	M	J	J	A	
Artichoke (suckers)													
Asparagus (crowns)													
Beans (climbing)													
Beans (dwarf)													
Broad Beans													
Beetroot													
Borecole													
Broccoli													
Brussels sprouts													
Cabbage													
Chinese Cabbage													
Carrots													
Cauliflower													
Celery													
Cress & Mustard													
Cucumbers													
Endive & Chicory													
Eggplant													
Florence Fennel													
Garlic (cloves)													
Kohl Rabi													
Kumara (plants)													
Leeks													
Lettuce													
Marrows (Zucchini, Courgettes)													
Melons													
Okra													
Onions													
Onions (spring)													
Parsnip													
Peas													
Pepper (Capsicum)													
Potatoes (tubers)													
Pumpkins													
Radish													
Shallots (cloves)													
Spinach													
N.Z. Spinach													
Salsify													
Silverbeet													
Swede & Turnip													
Sweetcorn													
Tomatoes													

AUGUST

With its temperamental weather changes, this month heralds new activity in the garden. It is time to establish the spring garden, with its panoply of vegetables, flowers and fruit.

Bulbs are flourishing in the flower beds and new buds are beginning to appear on the fruit trees. More seed can be sown in trays for transplanting later, while soil is prepared with fertiliser, peat and compost. Nature has a way of prompting the gardener to action in August, which will bring the reward of a satisfying harvest later on.

VEGETABLES

August is the time to begin planting the spring garden for vegetables, flowers and fruit. Seed can be sown in trays for transplanting in the warm weather to come.

Early crop and Little Finger carrots and Red Devil Radish can be sown direct into the garden for early cropping. Where the soil is cold and wet the bed should be raised with the addition of peat and compost to prepare for planting later. Work in a base dressing of Gro-plus General Garden Fertiliser and lime.

Continue spraying winter crops of cabbage, cauliflower and broad beans with Copper oxychloride to combat ring spot, downy mildew and chocolate spot.



FRUIT

Make an application of fertiliser to the base of fruit trees. Spread 2–4kg around the base of established trees and 500g–1kg around young trees. Spread fertiliser evenly over the roots which should extend approximately 45cm beyond the tips of the outermost leaves. Take care to keep fertiliser away from the trunk, and water in well.

Citrus fruits will be approaching maturity. High skin colour is caused by cold temperatures and is not always an indication of ripeness.

Green tip or early bud movement begins in peaches, nectarines, plums, apricots and cherries. It is the time to control leaf curl and bladder plum. These diseases attack the embryo leaves and fruit as they emerge from the bud scales and it is important to spray with Copper oxychloride at this stage.

Prune out overgrown passionfruit vines to stimulate fresh growth which new season's fruit will be produced on.

FLOWERS

Daffodils, jonquils, hyacinths, narcissus and lachenalias are all in full bloom. Carefully cultivate to remove weeds and aerate surrounding soil.



LAWNS

Lawns can be topdressed with Sulphate of Ammonia using 20 grams per square metre. Take care to apply evenly. Damp mossy areas can be treated with Mostox.

CONTAINER PLANTS

Plant up new season's spring vegetables in containers. Portable container gardens can be placed under shelter on patios or in porches for warmth and protection. Container-raised vegetables will mature earlier no matter how cold or difficult the climate may be. Repot overgrown pot plants. Trim back some of the old roots when repotting with fresh potting mix.

SEEDS TO SOW

FLOWER

Temperate climate: ageratum, alyssum, amaranthus, aster, balsam, bedding begonia, tuberous begonia, boronia, Californian poppy, carnation, celosia, chrysanthemum, cockscomb, coleus, cosmos, dahlia (seed), delphinium, dianthus, everlasting daisy, gaillardia, gazania, geranium, gerbera, globe amaranth, gloxinia, gypsophila, honesty, impatiens, kochia, African marigold, mignonette, nasturtium, ornamental basil, ornamental chilli, petunia, phlox, portulaca, rudbeckia, salpiglossis, salvia, snapdragon, spider flower, statice, strawflower, Sturts desert pea, sunflower, Swan river daisy, verbena, viscaria, zinnia.

Cold climate: balsam, tuberous begonia, gypsophila, African marigold, polyanthus, portulaca, rudbeckia, salpiglossis, salvia, scabiosa, snapdragon, spider flower, statice.

VEGETABLE

Temperate climate: beetroot, cabbage, cape gooseberry, capsicum, carrots, celery, chicory, Chinese cabbage, choko, cress, endive, kohl rabi, lettuce, mustard, spring onions, parsnip, peas, potatoes (tubers), radish, rhubarb (seed), rhubarb (crowns), salsify, silverbeet, tomatoes.

Cold climate: broad beans, cabbage, Chinese cabbage, cress, kohl rabi, lettuce, mustard, onions, spring onions, parsnip, peas, potatoes (tubers), rhubarb (crowns), salsify, silverbeet, spinach, swedes, turnips.

SEPTEMBER

A hectic time in the garden for seed sowing, spraying and fertilising. Buds, shoots, flowers and seeds are sprouting and growth becomes more rapid as days gain in length and become warmer, and soil temperatures rise.

Early spring gardening can be difficult in many districts with changeable cold snaps and late spring frosts likely. Remaining winter green crops can be dug into the soil.

VEGETABLES

Young seedlings are often attacked by downy mildew at this time of the year with yellowing of the leaves and poor growth being typical symptoms. Spray with Copper oxychloride or Bravo. Should aphids or mealy bug be a problem, spray with Maldison or Orthene. Remember Blitzem or Mesurol slug and snail pellets to protect young seedlings when planting out.

Early sowings of broad beans will begin to flower. Growth will be quite rapid and plants may treble their size within six to eight weeks. It may be necessary to provide some sort of support. Spray with Bravo to prevent rust and chocolate spot.

Transplant cabbage and cauliflower seedlings.

Vegetables to harvest are broccoli, Brussels sprouts, cabbage, carrots, cauliflower, celery, leeks, lettuce, parsnips, radish, rhubarb, silverbeet, spinach and turnips.

FRUIT

Fruit trees require spraying: it is during this period that fungus infections can invade the growing shoots and continue to develop through the season. Diseases such as leaf curl of peaches can only be controlled by spraying with Copper oxychloride during the bud swelling and bud burst period. The other major devastating fungus disease is brown rot, which invades the fruit during the flowering and early fruit formation stages. It is necessary to follow a strict programme from bud swelling to petal fall to ensure a reliable crop. This is particularly important in warmer, northern districts where fungus diseases are prevalent. Saprol is an extremely effective fungicide against brown rot which should be applied during the blossom period through to fruit formation at 10–14 day intervals.

Apples and pears are reaching various stages of bud development.

New season's growth on citrus is well advanced with new leaves and flower buds appearing. Black aphids are commonly found on young shoots. Control with Orthene. Apply citrus fertiliser around the base of the tree using 1–4kg per established tree.

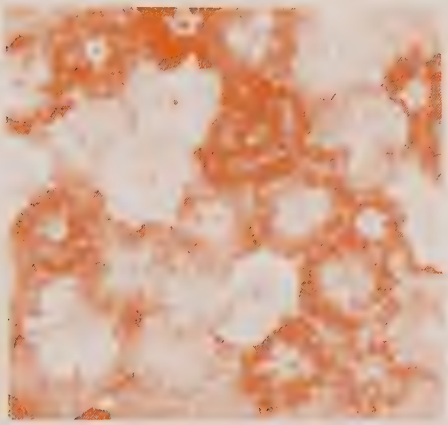
Apply Copper oxychloride to grapes as bud bursts open. An application of fertiliser will also be beneficial. Use 1–2kg per established vine.

Plant young passionfruit vines. Drainage is important on heavy, wet sites, and a raised growing position can be built in which to place the young vine. Incorporate plenty of organic matter such as peat and compost.

Early season strawberry flowers will have set fruit. Apply regular sprays of Bravo to prevent leaf spot or botrytis.

CONTAINER PLANTS

Once flowering of cyclamen has finished, pot-grown plants can be transplanted outdoors in a sheltered place. In cooler southern areas stand the pot in a sheltered place outdoors.



FLOWERS

Roses are well advanced in growth. Regular sprays with Shield will prevent the fungus diseases and insect pests. Apply a mulch to the base of all bushes along with a dressing of rose fertiliser.

SEEDS TO SOW

FLOWER

Temperate climate: ageratum, alyssum, amaranthus, aster, balsam, bedding begonia, tuberous begonia, boronia, Californian poppy, carnation, celosia, chrysanthemum, cockscomb, coleus, cosmos, dahlia (seed), dianthus, everlasting daisy, gaillardia, gazania, geranium, gerbera, globe amaranth, gloxinia, gypsophila, honesty, impatiens, kochia, African marigold, mignonette, nasturtium, ornamental basil, ornamental chilli, phlox, rudbeckia, salpiglossis, salvia, snapdragon, spider flower, statice, strawflower, Sturts desert pea, sunflower, Swan river daisy, verbena, viscaria, wallflower.

Cold climate: ageratum, alyssum, amaranthus, aquilegia, arctotis, aster, balsam, tuberous begonia, bellis, boronia, calceolaria, calendula, Californian poppy, candytuft, carnation, celosia, chrysanthemum, cockscomb, coleus, cornflower, cosmos, dahlia (seed), delphinium, dianthus, everlasting daisy, gaillardia, gazania, geranium (seed), gerbera, globe amaranth, gloxinia, godetia, gypsophila, honesty, impatiens, kochia, larkspur, linaria, Livingstone daisy, lobelia, lupin, marigolds, mignonette, nasturtium, nemesia, nemophila, nigella, ornamental basil, ornamental chilli, painted daisy, petunia, phlox, portulaca, rudbeckia, salpiglossis, salvia, scabiosa, snapdragon, spider flower, statice, strawflower, Sturts desert pea, sunflower, Swan river daisy, sweet pea, verbena, viola, Virginian stock, viscaria, zinnia.

VEGETABLE

Temperate climate: beetroot, cabbage, cape gooseberry, capsicum, carrots, celery, chicory, Chinese cabbage, choko, cress, eggplant, endive, kohl rabi, leeks, lettuce, marrows, melon, mustard, spring onions, parsnip, potatoes (tubers), radish, rhubarb (seed), rhubarb (crowns), salsify, silverbeet, squash, tomato.

Cold climate: beetroot, cabbage, cape goosberry, capsicum, carrots, celery, chicory, Chinese cabbage, cress, eggplant, endive, kohl rabi, lettuce, mustard, spring onions, parsnip, peas, potatoes (tubers), radish, rhubarb (seed), rhubarb (crowns), salsify, silverbeet, swede, turnip.

OCTOBER

Springtime in the garden brings the full flowering of fruit trees and shrubs. Blossom provides delicate colour amongst new green growth, and in the flowerbeds the bulbs are giving way to a riot of other spring flowers.

This is one of the busiest months of a gardener's year, when soil must be carefully prepared and fertilised for the planting of early crops.

VEGETABLES

Most warm season vegetables can be sown towards the end of this month as the soils warm up. Concentrate on good preparation by using generous quantities of compost or peat. Raise the planting area 15–20cm above the surrounding soil level. This not only improves drainage, but allows the soil to warm up more quickly.

Sowing summer vegetable seed outdoors too early, in cold soil, can result in a poor germination and unthrifty plants. Beans, cucumbers, pumpkins and melons will require minimum germination temperatures of 15°C, the optimum temperature for even germination being 24°C. Do not be too impatient in getting these vegetables underway.

Start cucumbers and melons in pots or punnets indoors for an early start.

Young seedlings are often attacked by downy mildew at this time of the year. Typical symptoms include yellowing of leaves, pale brown patching with surface pitting and poor growth. Spray with Bravo or Copper oxychloride.

Broad beans should be sprayed with Bravo if chocolate spot or rust appear.

Lay Blitzem or Mesurol slug and snail pellets when new seed emerges or when plants are transplanted. Lightly scatter pellets every three to four days. During prolonged wet weather, Mesurol pellets are more effective than Blitzem.

FRUIT

Spring blossom is now complete on stonefruit trees, but apples and pears will be coming into full bloom. Warm sunny days encourage bees to work amongst the flowers and will result in a good fruit set. Continue with regular sprays of Saprol to prevent fungus diseases.

New season's growth is well advanced on grapes, and flowering commences this month. Spray with Bravo at 14 day intervals to prevent downy mildew, powdery mildew and black spot.

Citrus fruits of most varieties will now have reached full maturity although tangelos will improve if left on the tree until next month. Apply Copper oxychloride spray as a pre-blossom treatment to prevent build-up of fungus diseases.

Early season strawberries start to ripen. Occasional applications of Lush liquid fertiliser over the leaves will assist plants to make sturdy growth and improve fruit size. Continue to spray with Bravo and Benlate to control botrytis, sclerotinia and leaf spot diseases.

LAWNS

Rapid growth of lawn demands constant mowing and weekly trimming. Fertilise with Gro-Plus Lawn Fertiliser.

FLOWERS

As late winter and spring flowering plants complete their season, beds will need cleaning up for planting of summer flowers. Old plants should be removed and placed in a compost heap. Bulbs that have become overcrowded should be lifted and divided and then replanted or stored until the next growing season.

Once flowering is complete on spring flowering shrubs, prune back growth to retain shape and size.

Early flowering roses will appear this month. Bushes start to make their most rapid spring growth.

Keep a constant watch for any sign of pest and disease and spray with Shield.



Spring blossom

SEEDS TO SOW

FLOWER

Temperate climate: ageratum, alyssum, amaranthus, aster, balsam, bedding begonia, boronia, Californian poppy, carnation, celosia, chrysanthemum, cockscomb, coleus, cosmos, dahlia, dianthus, everlasting daisy, gaillardia, gazania, geranium (seed), gerbera, globe amaranth, gloxinia, gypsophila, honesty, impatiens, kochia, African marigolds, nasturtium, ornamental basil, ornamental chilli, petunia, phlox, portulaca, rudbeckia, salpiglossis, salvia, snapdragon, spider flower, statice, strawflower, Sturts desert pea, sunflower, Swan river daisy, verbena, viscaria, zinnia.

Cold climate: ageratum, alyssum, amaranthus, arctotis, aster, balsam, bedding begonia, tuberous begonia, bellis, boronia, calceolaria, Californian poppy, celosia chrysanthemum, cockscomb, coleus, cosmos, dahlia, delphinium, dianthus, everlasting daisy, gaillardia, gazania, geranium (seed), gerbera, globe amaranth, gloxinia, gypsophila, kochia, marigolds, mignonette nasturtium, nemesia, nemophila, nigella, ornamental basil, ornamental chilli, painted daisy, pansy, petunia, phlox, portulaca, rudbeckia, salpiglossis, salvia, snapdragon, spider flower, strawflower, Sturts desert pea, sunflower, Swan river daisy, sweet pea, verbena, viola, Virginian stock, viscaria, zinnia.

VEGETABLE

Temperate climate: beans, beetroot, cabbage, cape gooseberry, capsicum, carrots, celery, chicory, Chinese cabbage, choko, cress, cucumber, eggplant, endive, leeks, lettuce, marrow, melons, mustard, okra, spring onions, parsnip, pumpkin, radish, rhubarb, salsify, silverbeet, squash, sweet corn, kumara (shoots), tomato.

Cold climate: beans, beetroot, Brussels sprouts, cabbage, cape gooseberry, capsicum, carrots, celery, chicory, chinese cabbage, cress, cucumber, eggplant, endive, kohl rabi, leeks, lettuce, marrow, mustard, okra, spring onions, onions, peas, potatoes (tubers), radish, rhubarb, salsify, silverbeet, squash, sweet corn, tomato.

NOVEMBER

Early summer has arrived and this is another colourful and busy month in the garden. Growth is rapid and plants must be kept well watered to maintain growth. It is important to apply water before plants show visible signs of wilting. Mulching will help preserve soil moisture and should be carried out now to be effective over the drier months. Mulching materials include peat, bark, compost and should be spread around the base of plants to a depth of three centimetres.

VEGETABLES

Vegetables will benefit from a side dressing of General Garden Fertiliser and regular watering. Spray with Target or Orthene to control insects. Blight is best controlled with Bravo, Saprol or Benlate.

Asparagus will continue to be harvested. Cultivate carefully to remove weeds from bed.

Broad beans, cabbage, carrots, cauliflower, lettuce, onions, peas, potatoes, radishes, silverbeet and spinach can all be harvested.

Dwarf and climbing beans can be sown this month. For a continuous harvest make regular sowings at three weekly intervals throughout the summer.

Scarlet runner beans are best grown in warm sheltered positions to ensure a good fruit set.

Sow sweet corn. Sow quick and long maturing varieties at the same time to give a spread of harvest or sow at two weekly intervals.

FLOWERS

Summer annuals can be transplanted.

Gladiolis should also be planted now for late summer flowering.

Amaryllis, another favourite, can be planted in a warm, sheltered position or grown as an indoor flowering plant.

Roses will benefit from a dressing of rose fertiliser and should be sprayed with Shield to prevent attacks from pests and diseases. Shield can also be used to protect other ornamentals.

Canna lilies can be planted in warm, sheltered, sunny positions. Water lilies can be planted in ponds: they grow best in stagnant water and flower profusely when water temperatures increase in mid-summer.

Chrysanthemums, carnations and impatiens are available from garden centres at this time and can be planted directly into the garden.



Avocado

FRUIT

Apply fertiliser to citrus and other fruit trees. Berryfruit such as boysenberry and blackberries should be sprayed with Bravo for dry berry diseases. Spray citrus trees with Copper oxychloride for

verrucosis and Orthene for insect pests.

Early varieties of plums and cherries mature in late November. Young trees should receive their first summer pruning. Trim out the strong vigorous growth and sappy growths in the centre of the tree. Old trees which are carrying a heavy crop of fruit will respond to a further dressing of fertiliser. Irrigate thoroughly if soil becomes dry.

New growth of grapes will be rapid and needs tying in.

After fruit set in citrus, another application of fertiliser can be made. Nutrition is important at this time.

Newly planted trees and shrubs will need close attention. Irrigate if the soil is dry and apply a mulch of compost to conserve soil moisture around roots.

Trim back shoots on roses which have had flowers cutting to three or four buds below old flower heads. This will encourage further summer flowering.

CONTAINER PLANTS

Daily watering of container plants is important, particularly in warmer weather, as plants can grow very quickly. Containers can be moved into partially shaded areas in hottest months.

Turn compost heaps regularly. With warm summer temperatures, composting is rapid and may also need water. Once a compost has turned a dark, chocolate-brown colour, it is sufficiently decomposed to incorporate into the garden soil or to use as a mulch.

SEEDS TO SOW

FLOWER

Temperate climate: ageratum, alyssum, amaranthus, aster, balsam, bedding begonia, Californian poppy, celosia, chrysanthemum, cockscomb, coleus, cosmos, dahlia (seed), dianthus, gazania, geranium (seed), gerbera, globe amaranth, gypsophila, kochia, African marigold, nasturtium, ornamental basil, ornamental chilli, petunia, phlox, portulaca, rudbeckia, salpiglossis, salvia, spider flower, Sturts desert pea, sunflower, Swan river daisy, verbena, viscaria, zinnia.

Cold climate: ageratum, alyssum, amaranthus, aster, balsam, bedding begonia, calceolaria, Californian poppy, celosia, chrysanthemum, cockscomb, coleus, cosmos, dahlia (seed), gazania, geranium, gerbera, globe amaranth, gypsophila, kochia, African marigold, nasturtium, ornamental basil, ornamental chili, petunia, phlox, portulaca, salvia, snapdragon, spider flower, strawflower, Sturts desert pea, sunflower, Swan river daisy, verbena, viscaria, zinnia.

VEGETABLE

Temperate climate: beans, beetroot, cabbage, cape gooseberry, capsicum, carrots, celery, chicory, Chinese cabbage, cress, cucumber, eggplant, endive, leeks, lettuce, marrow, melons, mustard, okra, spring onions, parsnip, pumpkin, radish, rhubarb, salsify, silverbeet, squash, sweet corn, tomato, turnips.

Cold climate: beans, beetroot, broccoli, Brussels sprouts, cabbage, cape gooseberry, capsicum, carrots, cauliflower, celery, chicory, Chinese cabbage, cress, cucumber, eggplant, endive, kohl rabi, leeks, lettuce, marrow, melons, mustard, okra, spring onions, parsnip, pumpkins, radish, rhubarb, salsify, silverbeet, squash, sweet corn, tomato.

DECEMBER

Summer is in full swing, filling the garden with attractive colours and aromas. The vegetable garden is full of succulent green and root vegetables waiting to be picked and the scarlet runner beans put out flowers to rival those in the flowerbeds.

Pay attention to watering, to keep all this burgeoning richness going; and pests will also be active amongst the foliage. The garden requires work in this season, but such activity is a pleasure amongst the wealth of greenery and flowers which crown the year's efforts.

VEGETABLES

With rapid growth of tomatoes, sweet corn and beans this month careful attention will have to be paid to cultivating, weeding, irrigation, feeding and spraying.

Caterpillars and whitefly are likely to become a problem. Orthene and Target provide best control, blights are best controlled with Bravo, while Saprol is better for powdery mildew on cucumbers and pumpkins.

Continue successive sowings of summer vegetables including beans, beetroot, carrot, celery, sweet corn, cucumber, lettuce, marrow, melons and tomatoes.

If earwigs appear, spray with Target or Orthene.

Vegetables to harvest are asparagus, beetroot, broad beans, beans, cabbage, carrots, cauliflower, cucumber, lettuce, marrow, onion, peas, potatoes, silverbeet and tomatoes.

Sow dwarf beans at two to three week intervals. Sow climbing beans at six to eight week intervals.

Scarlet Runner beans produce masses of flowers. However, it is common for many of these flowers to drop off, due to climatic conditions such as strong winds or cold snaps at the time of flowering. Irrigate if soil becomes dry and apply a side dressing of fertiliser.

Aphids and white butterfly caterpillars are likely to cause damage on cabbages, broccoli, cauliflowers and Brussels sprouts at this time of the year. Spray with Orthene, Target or Derris.

Eggplant and pepper transplants will be ready to plant out. Choose the warmest and most sunny growing position where they will get maximum summer heat.

September and October plantings of peas will be ready for harvest. Potatoes will require mounding up with soil to prevent damage from potato tuber moths grubs.

FLOWERS

Anemones and ranunculus become available in December and can be planted for flowering during May, June and July.

Pinch and tie chrysanthemums if they have been grown as long-stem single blooms. Continue to water when weather is dry.

Fertilise roses and spray with Shield to prevent pests and diseases.

Summer growth of lillium, dahlia, gladioli, chrysanthemum is well advanced. Cultivate frequently around plants. Irrigate whenever soil is dry.

FRUIT

Further applications of fertiliser will help increase the size of fruit on fruit trees. Use 1–4kg per tree depending on the size of tree.

Continue spraying pip- and stonefruit with Saprol for black spot and brown rot control. Saprol will also give excellent control on powdery mildew of tamarillos. Citrus should be sprayed with Copper oxychloride to prevent



verrucosis and leaf curl.

Keep passionfruit well watered and apply a General Garden Fertiliser. Spray with Copper oxychloride to prevent fungus diseases.

Strawberries will be ready for harvest. Plants may need netting to prevent bird damage.

Main harvest of raspberries is starting. Leafroller caterpillars can be troublesome. Spray fruits with Carbaryl which has only a one day waiting period after application before harvest.

Maintain spraying of roses to prevent pests and diseases. Apply a side dressing of fertiliser to stimulate late summer growth. Keep bushes irrigated when dry.

LAWNS

Summer weather causes drying out of lawns. Do not cut the lawn too closely, and water as frequently as possible.

CONTAINER PLANTS

Indoor plants should be moved away from hot windowsills to avoid burning at this time of the year. As the weather gets warmer the frequency of watering and feeding should be increased. Repot winter and spring flowering indoor plants such as orchids.

Summer is a difficult time to care for container plants. Dry sunny conditions cause severe water stress. They will need daily watering, at times twice daily.

SEEDS TO SOW

FLOWER

Temperate climate: ageratum, alyssum, amaranthus, aster, Californian poppy, celosia, cockscomb, coleus, cosmos, cyclamen, dahlia (seed), gazania, geranium (seed), gerbera, globe amaranth, kochia, African marigold, nasturtium, ornamental basil, ornamental chilli, petunia, phlox, portulaca, rudbeckia, salpiglossis, spider flower, Sturts desert pea, sunflower, Swan river daisy, verbena, viscaria, zinnia.

Cold climate: ageratum, alyssum, aster, balsam, calceolaria, Californian poppy, celosia, chrysanthemum, cockscomb, coleus, cosmos, cyclamen, dahlia (seed), forget-me-not, gazania, geranium, gerbera, globe amaranth, gypsophila, kochia, nasturtium, ornamental basil, ornamental chilli, petunia, phlox, portulaca, salvia, snapdragon, spider flower, Sturts desert pea, sunflower, Swan river daisy, verbena, viscaria, zinnia.

VEGETABLE

Temperate climate: beans, beetroot, broccoli, Brussels sprouts, cabbage, cape gooseberry, capsicum, carrots, cauliflower, celery, chicory, Chinese cabbage, cress, cucumber, eggplant, endive, leeks, lettuce, marrow, melons, mustard, okra, spring onions, parsnip, pumpkin, radish, rhubarb, salsify, silverbeet, squash, sweet corn, tomato.

Cold climate: beans, beetroot, broccoli, Brussels sprouts, cabbage, carrots, cauliflower, celery, chicory, Chinese cabbage, cress, cucumber, endive, leeks, lettuce, marrow, melons, mustard, okra, spring onions, parsnip, radish, rhubarb, salsify, spinach, squash, sweet corn.

JANUARY

January is a time for outdoor lunches under shady trees, for children to play under the hose on the lawn and for some of the hottest days of summer.

The garden looks beautiful and is also demanding: take care that soil moisture is constantly maintained. Fruits and flowers need attention, but there are often helpers on hand: holidaying children can be encouraged to take an interest, especially in easy tasks like pulling weeds.

Planning and planting for the winter garden should also begin now.

VEGETABLES

This is the time to plant out cabbage, cauliflower, leeks, lettuce, silverbeet and spinach. Orthene, Target or Derris can be used to control white cabbage butterfly caterpillars, which are likely to be particularly troublesome.

Carrots and parsnips sown in November and December will be growing rapidly. Finger-size seedlings can be pulled out and eaten, to leave more growing space for the others. Carrot Rust Fly can be prevented with Diazinon Granules.

Cucumbers and marrows will be ready for harvest. Marrows and zucchini will need daily picking to encourage continuous fruiting.

Garlic and onions may be ready for harvest. Garlic should be dug up and left to dry on the soil surface, even though they are still green and growing. Once the stems of onions have bent over, they need to be pulled and left to lie in the sun to dry and cure. Most will need 10–14 days to dry out sufficiently before storing.

New potatoes can be harvested as required once flowering is complete. Keep soil mounded up around potato plants, as cracked, dry, open soils will expose the tubers to the potato tuber moth.

Sweet corn in warm areas will be ready to harvest. Once the tassels have begun to shrivel and dry, the cobs are ready for picking.

Tomatoes will be ready for harvest, and can be picked as fruit show colour. Trim off bottom leaves from plant as the fruit ripens, to help better air circulation around the base of the plant. Continue to remove laterals and tie up the stems of tall growing varieties.

Spray with Copper Oxychloride or Bravo to control blight on tomatoes and potatoes.

FLOWERS

Marigold, zinnia, petunia and salvia will all be in full bloom. Pick off any old flower heads and keep the plants well watered.

Spray gladioli with Orthene or Target to prevent thrip damage.

Spray dahlias with Shield to prevent powdery mildew and caterpillars.

Rust disease and black aphid may be a problem on chrysanthemums; they should be treated with Shield.

Early season planting of spring flowering bulbs can be started. Prepare sites by cultivating soil, removing weeds and incorporating Gro-Plus Bulb Food.

FRUIT

Stonefruit should be sprayed with Saprol at frequent intervals to prevent brown rot. Apples and pears should be sprayed with Carbaryl to control pear slug.

Summer pruning of peaches, nectarines and kiwifruit can be carried out.





New season's growth on grapes can be trimmed and tied down. Spray vines with Bravo for downy mildew, powdery mildew and black spot control. Apply side dressing of fertiliser to citrus trees, check wood carefully for attacks of stem borer. If present, prune out infected branches and burn.

The main harvest of berryfruits is complete: prune out the old canes which have fruited and tie in the new season's canes, selecting only the strongest. Spray with Bravo and Orthene for cane spot, blight and bud loss damage.

Tamarillos should be kept well watered and mulched in dry periods to avoid early fruit drop.

LAWNS

Keep lawns well watered to prevent grasses burning off; this will help prevent weed invasion.

CONTAINER GARDENS

Keep plants well watered, particularly those in smaller shallow containers (yellow leaves will indicate a nutrition problem). Include a liquid fertiliser at least once a week.

SEEDS TO SOW

FLOWER

Temperate climate: ageratum, alyssum, calceolaria, cineraria, cyclamen, forget-me-not, linaria, lupin, marigold (French), nasturtium, pansy, Iceland poppy, primula, stock, sweet pea, verbena, viola, wallflower.

Cold climate: ageratum, alyssum, calceolaria, cineraria, cyclamen, forget-me-not, gypsophila, hollyhock, lupin, marigold (French), Iceland poppy, primula, stock, sweet pea, verbena, viola, wallflower.

VEGETABLE

Temperate climate: beans, beetroot, broccoli, Brussels sprouts, cabbage, carrots, cauliflower, chicory, celery, Chinese cabbage, cress, cucumber, endive, kohl rabi, leeks, lettuce, marrow, mustard, onions, parsnip, radish, rhubarb, salsify, silverbeet, swedes, sweet corn and turnips.

Cold climate: dwarf beans, beetroot, broccoli, Brussels sprouts, cabbage, carrots, cauliflower, chicory, Chinese cabbage, cress, endive, kohl rabi, leeks, lettuce, marrow, mustard, spring onions, parsnip, radish, rhubarb, salsify, shallots, silverbeet, swedes, turnips.

FEBRUARY

If your garden has been well maintained, the green growth amongst trees and plants will still be lush and bright. Hibiscus are blooming and roses are still adding their brilliant splashes of colour to the flowerbeds.

As the hot, dry weather continues, many vegetables and fruits are coming to maturity, while the trees and shrubs are nearing the end of their main growing season.

The main concern is with moisture: plenty of water will be needed to maintain growth.

VEGETABLES

Cabbage, broccoli and leeks will be starting to make vigorous growth. These need to be encouraged so that they become well established for winter. Keep them well watered and apply a side dressing of General Garden Fertiliser.

Earlier sowings of carrots will be ready to harvest.

Pick cucumbers as they mature to encourage more fruit production. Baby cucumbers can be used as pickling gherkins.

Eggplants, peppers, tomatoes and cape gooseberries will be ready to harvest, plus garlic and onions. After they have been well dried, the tops and roots of onions can be trimmed and then stored in open-mesh wire trays or boxes. Alternatively tops may be tied to a string and hung up which is a very effective storing method.

Summer insects are likely to be a problem and should be sprayed with Target or Orthene. Blights are best controlled with Bravo or Copper Oxychloride while Saprol and Benlate are best for powdery mildew on cucumbers and pumpkins.

FLOWERS

Lightly prune roses and cut off dead heads to encourage more flowers. Spray roses with Shield to control insect pests as well as powdery mildew, rust and black spot.

Chrysanthemums should be disbudded, to encourage large blooms.

Thrips are a particular menace this month and are likely to attack gladioli, bottlebrush, ceanothus, fuchsia, azaleas and camellias, causing silvering of the leaves. Leafroller Caterpillar is also a problem on many shrubs, particularly manuka, camellia and chrysanthemum: they are easily recognised as they stick the young leaves together for protection. Psyllids attack pittosporum and pohutukawas, causing a blistering of the leaves. All of these insects can be quite devastating and are most effectively controlled by spraying at intervals of two to three weeks with Orthene.

Early autumn rains often cause plants to become diseased. Once foliage starts to deteriorate, old plants should be removed. Dahlias will continue flowering in warm northern and central areas. Close attention should be given to controlling powdery mildew by spraying with Saprol.

February is the main month to plant bulbs.

FRUIT

The main autumn harvest of fruits begins. Late-season peaches and plums mature rapidly. Apples develop a higher skin colour. Keep all trees well watered to swell fruit size.

As soon as harvest is complete of stonefruit, trees need to be summer pruned. Prune out overcrowded branches to open the tree's



framework and allow light to penetrate the lower portions of the tree. Space out current season's growth along the main fruiting laterals and remove about two thirds of new growth on vigorous trees. Pruning when trees are in full leaf is important for the prevention of silverleaf infection. Continue to spray apples and pears with Carbaryl to prevent codling moth and leafroller.

Grapes may need a further trimming of vine growth before harvest. Continue to spray with Bravo to prevent mildew forming. Mealy bug and leafroller may also be troublesome. Spray with Target; citrus trees should be sprayed with Copper Oxychloride for Verrucosis plus Target or Orthene for insect problems.

CONTAINER PLANTS

Indoor plants tend to need more water in summer so keep a close watch on all pots, particularly those near windows and in the sun. As temperatures rise there are also more likely to be pest and disease problems.

LAWNS

The main lawn sowing season is rapidly approaching. New lawn areas require thorough preparation.

SEEDS TO SOW

FLOWER

Temperate climate: ageratum, alyssum, aquilegia, arctotis, bellis, calceolaria, calendula, candytuft, Canterbury bells, cineraria, cornflower, cyclamen, delphinium, dianthus, everlasting daisy, forget-me-not, gaillardia, godetia, gypsophila, hollyhock, honesty, impatiens, larkspur, linaria, Livingstone daisy, lobelia, lupin, French marigold, mignonette, nasturtium, nemesia, nemophila, nigella, painted daisy, pansy, polyanthus, poor man's orchid, Iceland poppy, primula, scabiosa, snapdragon, spider flower, statice, stock, strawflower, sweet pea, verbena, viola, Virginian stock, wallflower.

Cold climate: ageratum, alyssum, aquilegia, arctotis, bellis, calendula, candytuft, Canterbury bells, carnation, cineraria, cornflower, cyclamen, delphinium, dianthus, everlasting daisy, forget-me-not, gaillardia, godetia, gypsophila, hollyhock, honesty, impatiens, larkspur, linaria, Livingstone daisy, lobelia, lupin, marigold (French), mignonette, nemesia, nemophila, nigella, painted daisy, pansy, polyanthus, poor man's orchid, Iceland poppy, primula, scabiosa, snapdragon, spider flower, statice, stock, strawflower, viola, Virginian stock, wallflower.

VEGETABLE

Temperate climate: dwarf beans, beetroot, broccoli, Brussels sprouts, cabbage, carrots, cauliflower, celery, chicory, Chinese cabbage, cress, endive, kohl rabi, leeks, lettuce, mustard, spring onion, parsnip, peas, radish, rhubarb, salsify, shallots, silverbeet, spinach, swedes, turnips.

Cold climate: beetroot, broccoli, Brussels sprouts, cabbage, carrots, chicory, Chinese cabbage, cress, endive, kohl rabi, leeks, lettuce, marrow, melons, spring onions, parsnip, radish, rhubarb, salsify, silverbeet, spinach, shallots, swedes turnips.

MARCH

Flowerbeds can be full of glorious colour in this month, with petunias, salvia and marigolds providing rich contrasts. This is harvest month for most fruits, and orchardists will be busy picking plums, apples and peaches and tidying the orchard areas.

VEGETABLES

In vegetable gardens in cooler districts, the harvest of outdoor summer-grown vegetables such as tomatoes, beans, cucumbers, zucchini, pumpkins and sweet corn is complete. In warmer areas most of these vegetables continue ripening throughout the autumn, but careful attention to spraying is needed to prevent late attacks from pests and diseases.

March is the most important month for sowing and planting winter vegetables. Late plantings of broccoli, Brussels sprouts, cauliflower, kohl rabi, silverbeet and spinach may be made. In warmer districts lettuce can be sown, along with sugar snap peas.

If caterpillars or other summer pests are attacking vegetables such as beans, tomatoes or cabbages, spray with Target.



FLOWERS

Flower gardens become a blaze of autumn colour in March. Continue to disbud late-flowering chrysanthemums for large blooms.

Thrips, mealy bug and leafroller caterpillars and blister scale may be major problems. All of these insects are devastating, but can be effectively controlled by spraying with Orthene at two to three weekly intervals.

March is an ideal month for planting out anemones and ranunculus. It is a good idea to start them in seed-raising mix, as this will give a more reliable germination. Dust bulbs with Germ Aid fungicide as an added precaution against 'damping off' rots.

FRUIT

March is predominantly a harvesting month for most fruit, particularly the main apple varieties and late stonefruits. Continue spraying the fruit with Carbaryl right up to harvest to prevent codling moth attacks. In all the areas, late varieties of stonefruits, particularly Golden Queen peaches, are very susceptible to brown rot. This attacks towards the end of the season so it is important to continue spraying with Saprol up until harvest.

Tamarillos will need sprays of Saprol to protect from powdery mildew.

Citrus trees should receive an autumn dressing of fertiliser.

ORNAMENTAL TREES AND SHRUBS

Many shrubs and trees are easily propagated from semi-mature tip cuttings. Select young strong shoots from the upper portions of the branches. Those which receive full sunlight on outer parts of trees are the best propagating material.

Trim hedges to allow some growth before winter sets in. Young shoots give rich winter colour.

In cooler areas the flowering season for roses is coming to an end. Prior to autumn leaf fall, apply Copper oxychloride to prevent overwintering of foliage and stem diseases.

LAWNS

Final steps of soil preparation and levelling need to be completed for new lawn areas. Choose a lawn seed mix which is best suited to your district and particular use. In the warmer northern areas successful establishment of fine-leaf turfs is often very difficult. Choosing a fine-leaved ryegrass is a far more suitable option under these circumstances. To prepare an old lawn surface for oversowing, give a vigorous raking. Fill in any dips and hollows with new topsoil before oversowing with seed.

CONTAINER GARDENS

Plant growth is slower, and watering and feeding are not so critical as they were during summer months.

SEEDS TO SOW

FLOWER

Temperate climate: ageratum, alyssum, aquilegia, arctotis, bellis, calceolaria, calendula, candytuft, Canterbury bells, carnation, cineraria, cornflower, cyclamen, delphinium, dianthus, everlasting daisy, forget-me-not, gaillardia, godetia, gypsophila, hollyhock, honesty, impatiens, larkspur, linaria, Livingstone daisy, lobelia, lupin, marigold (French), mignonette, nemesia, nemophila, nigella, painted daisy, pansy, polyanthus, poor man's orchid, Iceland poppy, primula, scabiosa, snapdragon, spider flower, statice, stock, strawflower, sweet pea, viola, Virginian stock, wallflower.

Cold climate: alyssum, aquilegia, arctotis, bellis, calendula, candytuft, Canterbury bells, carnation, cineraria, cornflower, cyclamen, delphinium, dianthus, everlasting daisy, forget-me-not, gaillardia, godetia, gypsophila, hollyhock, honety, impatiens, larkspur, linaria, Livingstone daisy, lobelia, lupin, marigold (French), mignonette, nemesia, nemophila, nigella, painted daisy, pansy, polyanthus, poor man's orchid, Iceland poppy, primula, scabiosa, snapdragon, statice, stock, strawflower, sweet pea, viola, Virginian stock, wallflower.

VEGETABLE

Temperate climate: beetroot, broccoli, Brussels sprouts, cabbage, carrots, cauliflower, chicory, Chinese cabbage, cress, endive, kohl rabi, leeks, lettuce, mustard, onions, spring onions, parsnip, peas, radish, salsify, shallots, silverbeet, spinach, swedes, turnips.

Cold climate: broad beans, cabbage; Chinese cabbage, cress, leeks, lettuce, melons, spring onions, radish, shallots, spinach, turnips.

APRIL

April showers bring much-needed moisture to the garden. The cooler nights add freshness to lawns and young seedlings, and everywhere there will be a flush of new green growth.

This means weeds, too, which will need to be removed from flower beds, borders, shrubberies and under hedges.

Leaves on the deciduous trees will be golden, red or brown and ready to fall. While tidying up the leaves, gardeners can pay attention to flower beds where the last of the summer blooms may be dying back. Bulbs can be planted in the freshly weeded earth.

VEGETABLES

In northern areas, late harvest of summer vegetables will continue. In colder southern areas the autumn harvest of broccoli, cabbage, cauliflower, swedes, turnips and spinach begins. Carrots and parsnips should be maturing along with celery. Further sowings of lettuces can be made. Choose hardy winter growing varieties, e.g. Triumph.

Pumpkins stored for winter use should be inspected occasionally for signs of decay. Fruit with any symptoms should be removed to prevent infection spreading.

Old rhubarb crowns which have become overcrowded need to be dug up and divided.

Spinach is a valuable winter and early spring vegetable and successive sowings can be made now.

Yams can be harvested. Dig carefully once the tops have been frosted or are withered and store for winter use.

April is also an excellent month for sowing Sugar Snap peas.

Winter plantings are best made on raised beds or ridges to avoid waterlogging. This is particularly important on heavy clay soils.

If caterpillar and other summer insects are attacking vegetables now about to be harvested, spray with Carbaryl or Target. These can both be used close to harvest.

FLOWERS

Another busy month for tidying up. The last of the summer annuals can be removed and many of the summer flowering perennials cut back. Damage from summer insects, thrips, mealy bug and leafroller caterpillar is usually evident at this time. However, in many cases the insect has gone leaving only the evidence behind.

Planting of anemones and ranunculus can still be made. For best results start them off in trays of seed-raising mix.

April is also the last chance for daffodils, jonquils and other spring flowering bulbs.

Cultivate and side dress with fertiliser the winter and spring flowering annuals and bulbs.

FRUIT

Apart from the late varieties of apples, most pip- and stonefruit have been harveted. In areas where silverleaf is known, it is a good idea to carry out pruning while the weather is still dry. This helps prevent silverleaf infection.

When leaf fall commences, apply Copper oxychloride to protect leaf scars from fungus infections.

Tamarillos should be reaching maturity and a late spraying with Saprol to control powdery mildew will be required in warm areas.

The main planting season for



strawberries is in April. In warm areas new beds will give best results, but in southern areas two year old beds are satisfactory. Strawberries do best in rich fertile free draining soils. Before planting incorporate generous quantities of compost and Gro-plus General Garden Fertiliser.

LAWNS

April is a good month for topdressing lawns to speed recovery from any damage suffered in dry weather. Apply lawn fertiliser at a rate of 30 grams per square metre on established lawns.

A balanced fertiliser containing iron will help produce a deeper colour and will promote fine grass species or discourage coarse grasses and weeds.

Late autumn is a good time for planting trees and shrubs as this allows for firm establishment before the onset of winter. Prepare the growing position carefully.

CONTAINER PLANTS

Place containers in warm, sunny situations. Growing mixes shrink with continued use. Add fresh potting mix to replenish.

SEEDS TO SOW

FLOWER

Temperate climate: ageratum, alyssum, aquilegia, arctotis, bellis, calceolaria, calendula, candytuft, Canterbury bells, carnation, cineraria, cornflower, cyclamen, delphinium, dianthus, everlasting daisy, forget-me-not, gaillardia, godetia, gypsophila, hollyhock, honesty, impatiens, larkspur, linaria, Livingstone daisy, lobelia, lupin, marigold (French), mignonette, nemesia, nemophila, nigella, painted daisy, pansy, polyanthus, poor man's orchid, Iceland poppy, primula, scabiosa, snapdragon, statice, stock, strawflower, sweet pea, viola, Virginian stock, wallflower.

Cold climate: alyssum, aquilegia, arctotis, bellis, calendula, candytuft, Canterbury bells, carnations, cineraria, cornflower, cyclamen, delphinium, dianthus, everlasting daisy, forget-me-not, gaillardia, godetia, gypsophila, hollyhock, honesty, impatiens, larkspur, linaria, Livingstone daisy, lobelia, lupin, marigold (French), mignonette, nemesia, nemophila, nigella, painted daisy, pansy, polyanthus, poor man's orchid, Iceland poppy, primula, scabiosa, snapdragon, statice, stock, strawflower, sweet pea, viola, Virginian stock, wallflower.

VEGETABLE

Temperate climate: broad beans, broccoli, cabbage, Chinese cabbage, cress, leeks, lettuce, mustard, onions, peas, potato (tubers), radish, shallots, spinach, turnips.

Cold climate: broad beans, cress, lettuce, mustard, onions, radish, shallots, spinach.

MAY

In this month the hint of winter is apparent right through the garden, as the growth rate for most plants slows down. Weeding, cultivation, pest and disease control are less of a worry than they were earlier in the year.

This is the time to concentrate on soil preparation for spring and summer planting.

VEGETABLES

Continue spraying celery, cabbages and cauliflowers with Copper oxychloride or Bravo to check fungus diseases and leaf spots. Slugs and snails can also be a problem at this time of the year. Lay Blitzem or Mesurol pellets when transplanting young seedlings.

May is an important month to sow broad beans.

Main winter harvest of celery continues, select outer stalks and use as required.

January/February sowings of kohl rabi are ready for harvest. Use leaves as greens in salads and coleslaws or cooked.

Garlic can be planted now.



Segments (or cloves) are broken off mother bulbs and planted to a depth of 3–4cm.

Any vacant garden areas can be sown in a cover crop of either lupins, barley or oats. These crops can then be dug into the soil during early spring. They are an excellent way to improve the soil structure for next season. Garden Compost should also be incorporated into the soil now.

FLOWERS

Protea, camellia, leucodendron, banksia provide winter colour.

Dahlia tubers and gladioli corms can be lifted. Dust with an insecticide and fungicide and store in a dry place. Cut back all old top growth of strong growing perennials such as geraniums and michaelmas daisies.

Overcrowding commonly occurs where different types of perennials are planted close to one another. The dominant ones will need trimming back to allow the less vigorous ones to be able to flourish.

Prepare new planting beds for roses, trees and shrubs before the soil becomes too wet. Work in plenty of compost or peat. The addition of organic matter improves drainage and aeration which is particularly important in clay soils over the winter.

Prune back those shrubs that have finished flowering.

LAWN CARE

Gro-Plus Lawn Fertiliser or Sulphate of Ammonia can be applied to the lawn at a rate of 30 grams per metre (approximately one handful). This will boost the growth of grasses and suppress growth of broad-leafed weeds. If these are a major problem it may be necessary to use a selective weedkiller, e.g. Turfix. If moss is a problem in those shady or poorly drained areas spray with Mostox. Many bare or thin areas of lawn can be raked over and reseeded.

FRUIT

Harvest feijoas as they fall to the ground. Guavas will also be ripening and normally need to be picked.

Pick kiwifruit while flesh is firm; they ripen in storage. Once the skin colour of tamarillos begins to change from green to red (or to yellow on yellow varieties!) they can be harvested.

Set out young strawberry plants.





SEEDS TO SOW

FLOWER

Temperate climate: ageratum, alyssum, aquilegia, arctotis, bellis, calendula, candytuft, Canterbury bells, carnations, cineraria, cornflower, cyclamen, delphinium, dianthus, everlasting daisy, forget-me-not, gaillardia, godetia, gypsophila, hollyhock, honesty, impatiens, larkspur, linaria, Livingstone daisy, lobelia, lupin, marigold (French), mignonette, nemesia, nemophila, nigella, painted daisy, pansy, polyanthus, Iceland poppy, primula, scabiosa, snapdragon, statice, stock, strawflower, sweet pea, viola, Virginian stock, wallflower.

Cold climate: gypsophila, French marigold.

VEGETABLE

Temperate climate: broad beans, broccoli, cress, lettuce, mustard, onions, spring onions, peas, potatoes, radish, shallots (bulbs), spinach.

Cold climate: cress, lettuce, mustard, onions, shallots (bulbs), spinach.

JUNE

This is the month when the skeleton and structure of the garden are most apparent. Established trees can be shaped and strengthened by judicious pruning and new sites can be prepared for fruit trees and ornamental plants which will enhance the general effect of the garden.

Roses and other flowering plants are also in line for pruning and cutting back. Other parts of the garden, especially the vegetable patch, should be full of healthy, green growth.

VEGETABLES

If planning has been thorough the garden will now be full of vegetables for winter use. Cabbage, cauliflower, broccoli and Brussels sprouts nearing maturity will benefit from a nitrogenous fertiliser. It is best applied in soluble form so that the nutrients are instantly available. These vegetables are heavy feeders and a fertiliser at this stage will increase the size of the curd and sprouts and maintain good health.

Slugs and snails are likely to be active on young seedlings; lay Blitzem or Mesurol pellets if necessary.

Lime can be added to build up soil structure along with peat and compost. If drainage is poor, raised beds offer a simple remedy.

Sow broad beans.

FLOWERS

Lift and divide overgrown, root-bound plants such as asters, phlox, cannas and dahlias. Prune hydrangeas. Thin out spindly growth and cut back strong growth to a pair of buds low down on the stem.





FRUIT

An ideal month for planting and pruning. Prune on a dry day to prevent infection of fungus spores which are transported in the rain. As an added precaution cover all pruning cuts with pruning paint. Begin pruning with stonefruit trees, as their spring growth commences earlier.

Peaches and nectarines fruit on one-year-old wood. They are strong growers and need shortening back to maintain a manageable size.

Apples, pears and plums fruit on two-year-old spurs. Pruning aims at thinning out old, unnecessary growth and maintaining a desirable size and shape.

All deciduous fruit trees should be sprayed with Copper oxychloride and Conqueror Oil for a general clean up.

ORNAMENTAL TREES AND SHRUBS

Prepare planting positions for new trees and shrubs. Incorporate topsoil in the bottom of the planting hole and leave exposed to aerate until ready for planting.

SEEDS TO SOW

VEGETABLE

Temperate climate: asparagus (crowns), broad beans, cabbage, cress, lettuce, mustard, onions, peas, potatoes, rhubarb (crowns), shallot (bulbs), spinach.

Cold climate: asparagus (crowns), cress, lettuce, mustard, onions, peas, spinach.

FLOWER

Temperate climate: tuberous begonia, Canterbury bells, delphinium, dianthus, godetia, gypsophila, larkspur, linaria, lupin, mignonette, painted daisy, statice, sweet pea, viola, Virginian stock, wallflower.

JULY

The cold days may make it seem unlikely, but the first days of early spring are only just around the corner.

A final tidying of the garden can take place, and meanwhile some seeds are being raised in containers for planting out later, as soon as ground temperatures are favourable.

New roses and other flowering shrubs and trees can be carefully planted in their chosen places and well cared for as they await the new spring growth.

VEGETABLE GARDEN

It is time to start preparing the vegetable garden. Cultivate any empty spaces by turning the soil and leaving rough clods exposed to the frosts. Weathering will help improve the soil structure. Apply garden compost which can be dug in later. Autumn green crops can also be dug in. The addition of Sulphate of Ammonia and lime will aid their breakdown.

Plants required for early spring planting can be sown in seed trays and kept in a warm place.

Sprout potatoes for an early start. Place the tubers in flat boxes in a light, sunny position where the temperature is fairly steady at about 5–10°C. After 6–8 weeks sprouts should appear from each tuber. Leave two or three short, thick sprouts and remove the weaker ones.

Continue spraying winter crops





such as cabbage, cauliflower and broad beans with Bravo or Copper oxychloride to combat fungus diseases (ring spot, downy mildew and chocolate spot).

FLOWERS

Roses and other flowering shrubs and trees can be planted. To keep established rose bushes vigorous and healthy, remove all diseased wood, spindly shoots and excessive growth. Spray with Copper oxychloride and Conqueror Oil to check scale, mites, aphids and fungus diseases.

Cut back untidy growth on perennials. Divide overgrown and root bound clumps.

FRUIT

Prune grapes. Cut out wood which has borne fruit and replace with young, new season's canes, selecting the strongest and removing those that are thin and weak.

CONTAINER PLANTS

Take care not to over-water indoor plants at this time of the year as they can be very susceptible to root rot. Move plants to a warm, well-lit location away from cold draughts.

Give maximum protection from cold weather to container plants outside. Stand pots in warm, sunny, sheltered positions.

SEEDS TO SOW

VEGETABLE

Temperate: asparagus (crowns), beetroot, broad beans, cabbage, carrots, Chinese cabbage, cress, kohl rabi, lettuce, mustard, onions, parsnip, peas, potatoes (tubers), rhubarb (crowns), salsify, silverbeet.

Cold climate: asparagus (crowns), broad beans, cress, lettuce, mustard, onions, peas, spinach, turnips.

FLOWER

Temperate climate: begonia (tuberous), delphinium, dianthus, gloxinia, gypsophila, honesty, impatiens, kochia, mignonette, statice.

Cold climate: carnation.

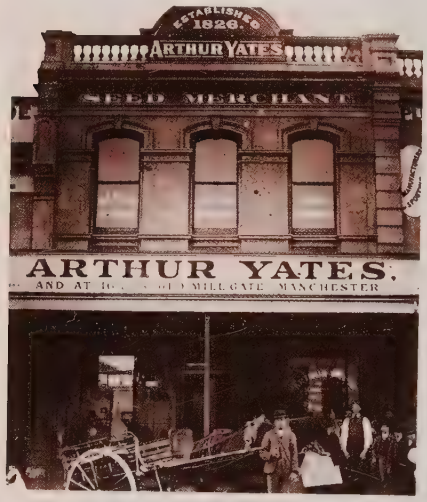
HISTORY

The Yates name has been synonymous with successful gardening in New Zealand since the turn of the century. It is a reputation that has built up with over 100 years in business. This achievement is shared with a small number of other respected organisations and companies within New Zealand.

In 1883 young Arthur Yates, a recent immigrant from Manchester, England (where his father was in the seed trade) opened a tiny shop in Victoria Street, Auckland, as a specialist supplier of quality seed. His takings on his first day totalled 1/6d. From these humble beginnings the business flourished.

Today Yates New Zealand Limited manufactures and sells a wide variety of horticultural and agricultural products and exports to 60 different countries of the world. All of this has been built around one product – **seed**. *Yates Reliable Seed.*

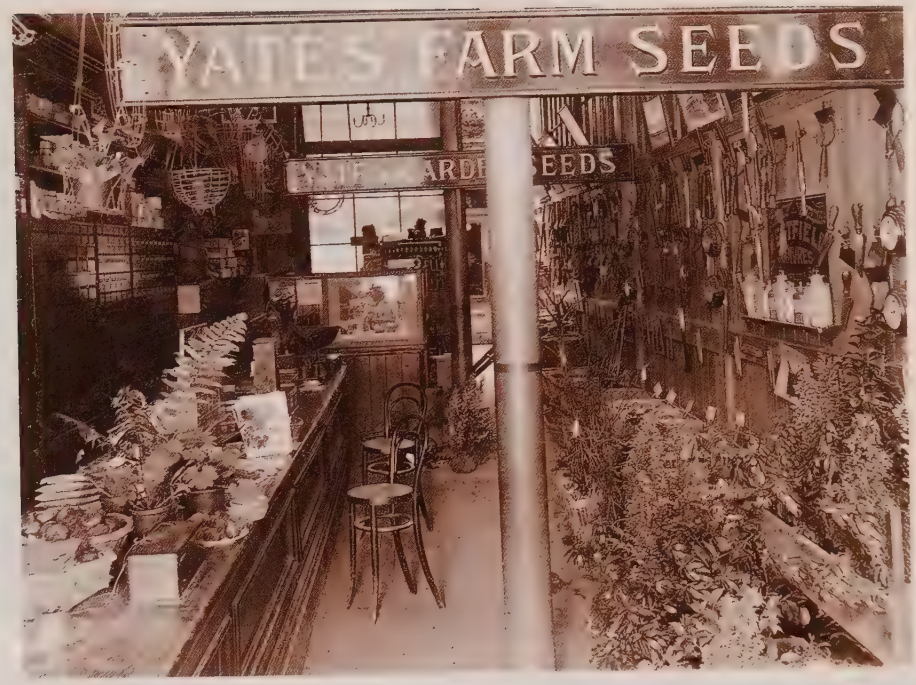
The following pictures are a selection from the archives.



46 Victoria Street, 1883–1888



Arthur Yates' Flower Seed department, 13 Albert Street, 1912



192 Queen Street, 1906–1911



13 Albert Street, early 1940's



Early New Zealand seed production of Field Marrows, Karaka



Pea selection trials, 1940



"Picking Peas" – quality control in the 1930's



Paper mulch experiment for weed control in Tomato crop, 1940's



Seed stand, 1940







Seed germination trials in rooftop laboratory of the Albert Street building, 1940



The nursery on the rooftop of the Albert Street building, 1940





Packaging and catalogues


6d.
BEAN
LEVIATHAN
CABBAGE
BEET
LETTUCE
PARSNIP
CAULIFLOWER
SWEDE TURNIP
SPINACH
RADISH
LONG SCARLET
ONION
CARROT
PEAS
EARLICROP
PARSLEY
YATES SEEDS


ICELAND POPPY
YATES' ARTISTS' GLORY
GODETIA
TALL DOUBLE MIXED
RUSSELL LUPINS
STOCKS
GIANT PERFECTION MIXED
CINERARIA
YATES' GOOD MIXED
SWEET PEA
CALENDULA
GOLDMINE MIXED
PANSY
MIGNONETTE
NEMESIA
LOBELIA
CRYSTAL PALACE COMPACTA
CORNFLOWER
DOUBLE MIXED
CARNATION
GIANT MALMAISON MIXED
ANTIRRHINUM
YATES SEEDS

INDEX

Acanthus 154
Achillea 154
Acrolinium 103
African Daisy 103
African Violets 267
Agapanthus 154
Ageratum 103
Akebia 159
Allium 165
Almond 258
Alstroemeria 165
Alyssum 103
Amaranthus 104
Amaryllis 166
Anemone 166
Angelica 148
Annuals 102
Anthirrhinum 104
Aphid 279
Apple 246
April Calendar 328
Aquilegia 104
Armeria 155
Artichoke 61
Artemisia 155
Asian Pear 248
Aster 104, 155
Astilbe 155
Asparagus 61
Aubergine 62
Aubretia 105
August Calendar 312
Autumn Crocus 166
Avocado 253
Azaleas 209

Babaco 253
Babiana 167
Bacterial Diseases 283
Balsam 105
Bamboo Control 307
Bark 5
Basil 148
Batchelors Button 110
Bay 148
Banana 253
Beans 62
Bear's Breech 155
Bedding Plants 102
Beetroot 63
Begonia 267
  Bedding 105
  Tuberous 167
Bellis 105
Bells of Ireland 105
Benlate 296
Berryfruit 239
Bergenia 155
Biennials 102
Biological Control 285
Black Spot 281
Bladder Plum 281
Blight 282
Blitzem 298
Bluebell 167
Blueberry 239
Borage 148
Bordeaux 296
Border Plants 102
Borecole 64
Botrytis 282
Bougainvillea 159
Brachyome 106
Brambles 239
Bravo 294
Broad Beans 64
Broccoli 65
Brodiaea 168
Bromeliads 268
Bronze Beetle 278
Brown Rot 282
Brussels Sprouts 66
Buffalo Grass 233
Bulbs 163
Budding 52
Busy Lizzie 106

Cabbage 66
Cacti 106,268
Calendula 106
Calla Lily 168
Calliopsis 110
Candytuft 107
Camassia 168
Camellias 209
Campanula 107, 156
Canna 168
Canterbury Bells 107
Cape Hyacinth 169
Capsicum 67
Cape Gooseberry 240
Carnation 107, 156
Caraway 149
Carbaryl 292
Carrots 68
Carrot Rust Fly 279
Cathedral Bells 108
Cauliflower 69
Casana 254
Casimira 254
Celeriac 70
Celery 70
Celosia 108
Chemical Control 285
Chervil 149
Cherry 249
Chestnut 258
Cherimoya 254
Chicory 72
Chieranthus 108
Children's Garden 4
Chinese Cabbage 70
Chinese Lantern 108
Chionodoxa 169
Chives 149
Choko 70
Chrysanthemum
  Annual 109
  Perennial 156
  Morifolium 268
Cineraria 109
Citrus 241
Clarkia 109
Clay Soils 10
Cleome 110
Cloches 59
Clematis 159
Climbers 159
Clubsin 296
Clubroot 282
Cobaea 108
Cockscomb 108
Codling Moth 278
Cold frames 58
Coleus 110, 269
Columbine 110
Compatibility Chart 287
Compost Bins 32
Composting 25
Conifers 205
Containers 262
Container Plants 263
Conqueror Oil 292
Cosan 275, 296
Conservatory 3
Coprosmas 215
Copper Oxychloride 275, 294
Coreopsis 110
Coriander 149

Cornflower 110
Corms 164
Cosmos 111
Cotula 233
Courgette 92
Cress 71
Crocus 169
Cranberry 254
Crop Rotation 57
Cucumber 71
Cultivation 12
Currant 240
Cuttings 51
Cyclamen 111, 269

Dahlia 111, 170
December Calendar 320
Decks 2
Delphinium 112
Derris Dust 275, 292
Dianthus 112
Diazinon 292
Dichondra 231
Dill 149
Dimorphotheca 113
Division 50
Double Daisy 113
Downy Mildew 282
Drainage 13
Drip Irrigation 15

Early Vegetables 58
Edging Plants 103
Eggplant 72
Endive 72
English Marigold 106
Erythronium 171
Everlasting Daisy 113

February Calendar 324
Feijoa 254
Ferns 270
  Native 221
Fertilisers 17-25
Ficus 160
Fig 255
Fireblight 283
Flax 219
Flower Seed Lists 144
Flower Seed Mixes 142
Florence Fennel 72
Floss Flower 113
Foliar Sprays 24
Forget-me-not 114
Forks 29
Freesias 171
Fritilaria 172
Fruit 237
Fungus Diseases 287

Gaillardia 114
Galtonia 172
Garden Construction 6
Garden Design 1
Gardenmaster 298
Garden Plan 6
Garden Style 2
Garlic 73
Gazania 157
Geranium 157
Gerbera 114
Germination Cabinet 39
Germination Troubles 46
Gelsemium 160
Gherkin 73
Gladioli 172
Glasshouses 5
Gloriosa Daisy 115
Gloriosa 173
Glory of the Snow 173
Gloxinia 173
Golden lily of valley 173
Gooseberry 241
Grafting 52
Grapefruit 242
Grapes 244
Grassgrub 278
Green Cover Crops 24
Green Vegetable Bug 279
Ground Covers 234
Guava 255
Gypsophila 115

Handweeding 302
Hanging Gardens 272
Hardenbergia 160
Hazelnut 259
Hedera 160
Hedges 210
Hedge Shears 34
Helianthus 115
Helichrysum 115
Heliopsis 157
Helleborus 157
Herbs 147-152
Hermodactylus 173
History 48
Hoes 30
Hosta 158
Hotcaps 58
House Plants 265
House Plant Ailments 266
Hollyhock 116
Honeysuckle 161
Horseradish 150
Hermodactylus 173

Honesty 116
Hydroponics 13
Hyacinths 174
Hybrid Seed 48

Ice Plant 116
Iceland Poppy 116
Impatiens 125
Impomoea 125
Ipheion 175
Iris 174
Irrigation Systems 15
Ivy 160
Ixia 175

Jacobean Lily 175
January Calendar 322
Jasmine 160
Jonquil 175
July Calendar 334
June Calendar 332

Kiwifruit 255
Kniphofia 158
Kohl Rabi 73
Kumquat 243
Kumara 73

Lachenalia 175
Larkspur 125
Lavender 150
Lawns 225
  Diseases 231
  Doctor 292
Lawn Pests 230
Lawn Seeds 227
Lawn Trimmers 35
Layering 50
Leaf Curl 282
Leaf Spot 282
Leek 74
Lemon 242
Lemonade 243
Lemon Tree Borer 280
Leafroller Caterpillar 278
Lettuce 74
Leucojum 175
Leptospermum 219
Lilium 175
Lily of the valley 176
Limonium 125
Lime 243
Lime Sulphur 296
Linaria 125
Linum 126
Livingstone Daisy 126
Liquid Fertilisers 22

Lobelia 126
Lonicera 161
Loppers 33
Loquat 256
Love lies bleeding 127
Lunaria 127
Lupin 126

Macadamia 259
Manuka 219
Mandarin 242
Mandevilla 161
Manures 19
Maldison 292
March Calendar 326
Marigold 127
Marjoram 150
Marrow 76
Mathiola 128
May Calendar 330
Mealy Bug 279
Melon 76
Mercury Bay Weed 231
Mesembryanthemum 128
Mesurol 298
Mexican Sunflower 128
Micro-jets 16
Micro-sprinklers 16
Michelmas Daisy 155
Mignonette 129
Mint 151
Mites 281
Mite Killer 294
Mixing Sprays 287
Mulberry 256
Muscari 176
Mushrooms 77
Mustard 78
Morning Glory 129
Myostis 129

Naked Lady 176
Narcissus 176
Nasturtium 130
Nemesia 130
Naturalising 103
Native ferns 221
  plants 215
  shrubs 224
  trees 223
Nectarine 251
Nematodes 281
Nerine 177
New Zealand Spinach 78
Night Scented Stock 78
November Calendar 318
Nuts 258

October Calendar 316
Okra 78
Onions 78
Orange 243
Orchids 270
Organic Fertilisers 19
Organic Gardening 273-275
Organic Matter 11
Ornamental Chili 131
Ornamental Gourd 131
Oriental Fruit Moth 280
Ornamental Kale 131
Ornithogalum 177
Orthene 294

Painted Daisy 132
Palms 272
Pansy 132
Parsley 151
Parsnip 79
Patios 2
Passiflora 161
Passionfruit 256
Passionvine Hopper 280
Peach 250
Pear 246
Peas 80
Peat Pots 46
Peat Soil 11
Pecan 258
Pegolas 3
Penstemmon 132
Peony Rose 158
Pepper 81
Perennials 102, 153
Persimmon 257
Pests 277
Petunia 133
Pepino 256
Pesticides 285-290
Plum 251
Phlox 133
Planting 196-199
Plant Names 207
Plant Training 212
Phormium 219
Physiological Disorders 284
Pin Cushion Flower 134
Pinks 112
Pittosporums 217
Pipfruit 245
Polyanthus 134
Poor Man's Orchid 134
Pop up Sprinklers 16
Portulaca 135
Potato 81
Pot Marigold 106
Potting 263
Powdery Mildew 283
Pricking Out 45
Primula 135
Prince of Wales Feather 135
Privet Control 307
Pruning 212
Pruning Saws 34
Pruning Tools 32-35
Pumpkin 83
Pyrethrum 275, 294
Pysllid 280

Quince 247

Radish 84
Raspberry 241
Rakes 31
Ranunculus 166
Red Hot Poker 158
Reseda 135
Rhizomes 164
Rhododendrons 209
Rhubarb 85
Rock Garden 5
Rock Melon 76
Romulea 178
Roses 187-193
  diseases 193
  pests 193
  pruning 189
  types of 191
Rosemary 151
Rose Spray 298
Rust 283
Rudbeckia 135

Sage 152
Salpiglossis 135
Salsify 85
Salvia annual 136
  perennial 158
Sandy soils 11
Sandersonia 178
Scabiosa 136
Saprol 296
Scarlet Flax 136
Schizanthus 136
Scilla 178
Scale Insects 280
Seaweed Extracts 24
Secateurs 32
Seed 37
Seed Germination 42
September Calendar 314
Shallots 85
Shield 298
Shovels 28
Shrubs 195, 205, 206
Silt Loam 11
Silverbeet 87

Silverleaf 283
Slugs 281
Snails 281
Snapdragon 137
Snake Head Iris 178
Snowflake 178
Soils 9
  acidity 24
  nutrients 11
  organisms 12
  sterilisation 12
  structure 10
  texture 10
Sowing Seed 44
Spades 29
Sparaxis 178
Specimen Trees 200
Spider Flower 137
Spider Lily 179
Spinach 86
Sprayers 286
Sprekelia 179
Squash 83
Star of the Veldt 137
Statice 137
Stock 137
Stonefruit 248
Stonefruit Blast 283
Strawberry 241
Strawflower 138
Successive Sowing 57
Summer Savory 152
Sunplant 138
Sunflower 138
Swan River Daisy 138
Sweetcorn 86
Sweet Pea 138
Sweet Williams 139
Swede 87

Tamarillo 257
Tangelo 243
Target 292
Tarragon 152
Theme Garden 5
Thrift 155
Thrips 279
Thuricide 275, 294
Thyme 152
Tissue Culture 53
Tithonia 139
Tigridea 179
Tomatoes 88
Tomato Spray 298
Tools 27
Tool Care 35
Transplanting 47, 196
Transvaal Daisy 139
Trapaeolum 139
Trees 195
Trigger Derris 292
Trigger Insect Killer 292
Tritonia 179
Trowels 30
Tuberose 164
Tulip 180
Turnip 87

Ugli 243

Vegetables 55
Vegetable Calendar 310
Vegetable Oyster 85
Vegetative Propagation 49-53
Verbena 140
Verrucosis 283
Viola 140
Violets 158
Virginia Creeper 161
Virginia Stock 140
Viruses 283
Viscaria 140
Volcanic Soil 11

Wallflower 141
Walnut 259
Water 9, 14
Watercress 92
Watermelon 76
Watsonia 180
Weeds 301-307
Weedkillers 303-305
Weevil 279
Wrenching 196
White Butterfly Caterpillar 279
Whitefly 280
Withholding Periods 289
Wisteria 161
Witloof 72

Yams 92

Zantedeschia 168
Zinnia 141
Zucchini 92



ACKNOWLEDGMENTS



We would like to express appreciation to all staff members of Yates New Zealand Limited who generously contributed towards this book with typing, proof reading, writing and technical expertise.

In addition our special thanks to the Auckland Regional Authority Botanic Gardens who provided extensive cultural information on ornamental plants and to New Zealand Home and Building magazine for the use of photographs on pages 1, 2 and 3.



The name Yates has been synonymous with successful gardening in New Zealand since the 1880's. Over the years the Yates Garden Guide has become one of this country's all time best sellers and its presence, in its various editions is a familiar sight in most New Zealand homes.

This present edition brings together the most up to date information and developments in horticulture as related to the home gardener. It is a practical handbook of gardening providing guidance for the beginner, inspiration for the reluctant, and is an indispensable first reference for the enthusiast.

Regardless of garden size you will find the advice practical and easy to follow, making gardening a fun and rewarding activity.

C0-BOR-162

Yates

9 400099 560293

Together, we've got a good thing growing.

ISBN 0 9597 843 0 6